

# Shell Lubricants Product Data Guide

Australian and New Zealand Edition



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Further information on the listed products or specialist products not listed may be obtained from the Shell Technical Advice Centre.

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**PLEASE NOTE:**  
The GREASES and FUELS sections are currently being updated and will be included in the next edition of the Shell Lubricants Product Data Guide.

If you have any enquiries about any of our Grease or Fuel products, please refer to the previous Shell Lubricants Product Data Guide or contact the Shell Technical Advice Centre:

AUSTRALIA: 13 16 18

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ENGINE OILS – PASSENGER CARS

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SHELL HELIX ENGINE OILS			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Helix Ultra AB 5W-30</b>  AUST ONLY	Shell Helix Ultra AB 5W-30 is a unique synthetic lubricant for ultimate long-term engine protection developed in close co-operation with leading car manufacturers. It is being approved against the most stringent BMW and Mercedes specifications. It is specially formulated to meet the demands of the latest engine technology and is approved by leading car manufacturers such as BMW and Mercedes in support of increased oil change intervals.	Mercedes and BMW cars serviced according an extended oil change programme.	Helix Ultra AB 5W-30 exceeds the following industry standards:  API SH/CF ACEA A3/B3/B4  And is specifically approved by Mercedes Benz and BMW according to the most demanding specifications:  Mercedes Benz MB 229.5 BMW Long life 01 VW 502.00/503.01
<b>Shell Helix Ultra VX 5W-30</b>  Fully synthetic passenger car motor oil	Shell Helix Ultra VX 5W-30 is a fully synthetic lubricant for both Gasoline and Diesel Passenger Cars. It has been specially designed to exceed the new VW specifications 507.00 and 504.00.	All VW cars asking for products meeting VW 507.00 and 504.00.	Shell Helix Ultra VX 5W-30 exceeds the requirements of the following specifications: VW 507.00 VW 504.00 ACEA C3, C2
<b>Shell Helix Ultra 5W-40</b>  The ultimate fully synthetic engine lubricant – proven on race tracks around the world	Shell Helix Ultra 5W-40 is a unique, fully synthetic lubricant for ultimate engine protection and performance.  Founded on Shell technology and Formula 1 racetrack experience over many years, Shell Helix Ultra 5W-40 has been tried, tested and proven even under the most extreme driving conditions.	It is ideal for modern and sports cars with engines that run faster and hotter in order to achieve maximum power, fuel economy and reduced emissions.  Being a high performing motor oil, it is also suitable for all turbocharged engines that run on gasoline fuels.	Shell Helix Ultra 5W-40 exceeds the requirements of many major car manufacturers and the following industry standards:  API SL/CF ACEA A3/B3/B4 JASO SG (0W-40) Rover Registered VW 500.00, 502.00, 505.00  Japanese Engines Qualified Porsche Approved BMW BMW Longlife-98 Peugeot-Citroen Meets requirements of PSA E-98 extended drain (Level 2 for application)  Mercedes Benz Sheet 229.3 Ferrari Factory Fill and Sole Service Fill Recommendation
<b>Shell Helix Ultra 15W-50</b>  AUST ONLY  The ultimate fully synthetic engine lubricant – proven on race tracks around the world	Shell Helix Ultra 15W-50 is a unique, fully synthetic lubricant for ultimate engine protection and performance.  Founded on Shell technology and Formula 1 racetrack experience over many years, Shell Helix Ultra 15W-50 has been tried, tested and proven even under the most extreme driving conditions.	It is ideal for modern and sports cars with engines that run faster and hotter in order to achieve maximum power, fuel economy and reduced emissions  Being a high performing motor oil, it is also suitable for all turbocharged engines that run on gasoline fuels.	Shell Helix Ultra 15W-50 exceeds the requirements of all major car manufacturers and the following industry standards:  API SL/CF ACEA A3/B3/B4 Rover Registered VW 501.01, 505 00  Japanese Engines Qualified Porsche Approved Peugeot-Citroen Meets requirements of PSA E-98 extended drain (Level 2 for application)  Mercedes Benz Sheet 229.1 Ferrari Factory Fill and Sole Service Fill Recommendation

ENGINE OILS – PASSENGER CARS

SHELL HELIX ENGINE OILS (continued)			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Helix Ultra Racing 10W-60</b>  AUST ONLY  Ultimate protection for performance motoring	Shell Helix Ultra Racing 10W-60 is a unique, fully synthetic lubricant for ultimate engine protection and performance. Founded on Shell technology and Formula 1 racetrack experience over many years, Shell Helix Ultra Racing 10W-60 has been tried, tested and proven even under the most extreme driving conditions.	Specifically designed for the Ferrari 360 Modena Challenge	Shell Helix Ultra Racing 10W-60 exceeds the requirements following industry standards:  API SL/CF ACEA A3/B3/B4-98  Ferrari approval
<b>Shell Helix Ultra Extra 5W-30</b>  NZ ONLY	Meets the needs of modern petrol and diesel engines including those with gasoline catalytic converters or diesel particulate filters.	Shell Helix Ultra Extra 5W-30 is approved by VW, Audi, BMW and Mercedes Benz for their most demanding needs.	Specifications and Manufacturers' approvals:  ACEA C2, C3 (A3/B3/B4) Mercedes Benz MB 229.51, 229.31 BMW longlife-04 VW 504.00/507.00
<b>Shell Helix Plus LB 10W-30</b>  Advanced protection for modern cars	Shell Helix Plus LB 10W-30 is a semi-synthetic engine oil formulated primarily for vehicles requiring a low viscosity API and ILSAC specification gasoline engine oil.	Service Fill engine oil for vehicles requiring a low viscosity API and ILSAC specification gasoline engine.  Suitable for lubrication of all modern cars and light commercial petrol engines which require a fuel-efficient oil.  Suitable for lubrication of vehicle engines using LPG fuel.  Can also be used for lubrication of lightly loaded diesel engines.	Shell Helix Plus LB 10W-30 exceeds the requirements of the following industry standards:  API SL ILSAC GF-3
<b>Shell Helix Plus Eco 10W-30</b>  Synthetic technology premium engine oil – excellent protection and fuel efficiency for high performance engines	Shell Helix Plus Eco 10W-30 is a synthetic technology engine oil formulated primarily to provide fuel efficiency for gasoline engines.	Suitable for lubrication of all modern cars and light commercial petrol engines which require a fuel efficient oil.	Shell Helix Plus Eco 10W-30 exceeds the requirements of the following industry standards:  API SL/CF ILSAC GF-3
<b>Shell Helix Plus 10W-40</b>  NZ ONLY  Synthetic technology premium engine oil – excellent protection for all car engines	Shell Helix Plus 10W-40 is an advanced technology, semi-synthetic motor oil that gives your engine exceptional cleansing properties with special cleansing agents that actively and continuously lock away harmful dirt and deposits.  Shell Helix Plus 10W-40 provides your enginewith superior protection and performance in today's passenger car engines.  With Shell Helix Plus 10W-40 you know you are doing the right thing for your car.	Semi-synthetic oil that is suitable for use in fuel injected, turbocharged, naturally aspirated and multi-valve passenger car engines that run on leaded and unleaded gasoline fuels.	Shell Helix Plus 10W-40 exceeds the requirements of the following industry standards:  API SL/CF ACEA A3/B3 JASO SG VW 505.00 approved BMW Special oil list Peugeot-Citroen Meets the requirements PSA E and D  Mercedes Benz Sheet 229.1 Rover Group Registered Ford Motor Co. M2C-153E



ENGINE OILS – PASSENGER CARS

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ENGINE OILS – PASSENGER CARS

SHELL HELIX ENGINE OILS (continued)			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Helix Plus 15W-50</b>  AUST ONLY  Synthetic technology premium engine oil – excellent protection for all car engines	Shell Helix Plus 15W-50 is an advanced technology, semi-synthetic motor oil that gives your engine exceptional cleansing properties with special cleansing agents that actively and continuously lock away harmful dirt and deposits. Shell Helix Plus provides your engine with superior protection and performance in today's passenger car engines.  With Shell Helix Plus 15W-50 you know you are doing the right thing for your car.	Semi-synthetic oil that is suitable for use in fuel injected, turbocharged, naturally aspirated and multi-valve passenger car engines that run on leaded and unleaded gasoline fuels.	Shell Helix Plus 15W-50 exceeds the requirements of the following industry standards:  API SL/CF ACEA A3/B3 JASO SG VW 505.00 approved Peugeot-Citroen Meets the requirements PSA E and D  Mercedes Benz Sheet 229.1 Rover Group Registered Ford Motor Co. M2C-153E
<b>Shell Helix Super 10W-30</b>  AUST ONLY  Quality automotive engine oil	Shell Helix Super 10W-30 is a quality lubricant based on a blend of high viscosity index mineral oils and selected additives.  It is blended to provide reliable passenger car engine protection in normal motoring conditions.	Gasoline engines – Naturally aspirated and turbocharged passenger car engines.	Shell Helix Super 10W-30 is suitable for use where the following specifications are called for:  API Service Classification SL ILSAC GF-3
<b>Shell Helix Super 15W-40</b>  High quality engine oil providing complete protection for all modern car engines	Shell Helix Super 15W-40 is a quality lubricant based on a blend of high viscosity index mineral oils and selected additives that give your car excellent clean up action with special cleansing agents that actively and continuously lock away harmful dirt and deposits.  Shell Helix Super 15W-40 is blended to provide reliable passenger car engine protection in normal motoring conditions.	Excellent clean up action for naturally aspirated and turbocharged multivalve passenger car engines.	Shell Helix Super 15W-40 is suitable for use where the following specifications are called for:  API Service Classification SL/CF ACEA A2/B2
<b>Shell Helix Super 20W-50</b>  AUST ONLY  High quality engine oil providing complete protection for all car engines	Shell Helix Super 20W-50 is a quality lubricant based on a blend of high viscosity index mineral oils and selected additives that give your car excellent clean up action with special cleansing agents that actively and continuously lock away harmful dirt and deposits.  Shell Helix Super 20W-50 is blended to provide reliable passenger car engine protection in normal motoring conditions.	Gasoline engines – Naturally aspirated and turbocharged multi-valve passenger car engines.  Shell Helix Super 20W-50 is ideal for slightly older cars and those with a lower performing engine.  It is also a top choice for town and city drivers who wish to minimize engine noise and protect their hard working vehicles from the extra stresses of today's stop start traffic environment.	Shell Helix Super is suitable for use where the following specifications are called for:  API Service Classification SL/CF ACEA A2/B2
<b>Shell Helix Red (Multi) 20W-50</b>  Quality mineral engine oil – reliable protection for everyday motoring	Shell Helix Red (Multi) is an SG rated 20W/50 mineral oil offering reliable engine protection for everyday motoring.  It is especially suited for older petrol vehicles.	Passenger car engines – Naturally aspirated passenger car engines fuelled by gasoline.	API Classification (Petrol) SG API Classification (Diesel) CD

ENGINE OILS – PASSENGER CARS

SHELL HELIX ENGINE OILS (continued)			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Helix Diesel Super 15W-40</b>  High quality mineral diesel engine oil for 4VVDs and light commercials	Shell Helix Diesel Super 15W-40 is a quality lubricant based on a blend of high viscosity index mineral oils and selected additives that give your car excellent clean up action with special cleansing agents that actively and continuously lock away harmful dirt and deposits.  Shell Helix Diesel Super 15W-40 is blended to provide reliable passenger car engine protection in normal motoring conditions.	All passenger diesel cars and other light diesel vehicles.	Shell Helix Diesel Super 15W-40 exceeds the requirements of all major car manufacturers and the following industry standards:  API Classification SL/CF ACEA A2/B2
<b>Shell Helix Super LPG 15W-40</b>  AUST ONLY  High quality mineral oil providing complete protection for LPG and dual fuel vehicles	Shell Helix Super LPG 15W-40 is a quality lubricant based on a blend of high viscosity index mineral oils and selected additives.  It is blended to meet the all year round requirements of passenger car engines fuelled with LPG or dual system Gasoline/LPG.  With Shell Helix Super LPG 15W-40 you know you are doing the right thing for your car.	Passenger car engines – Naturally aspirated passenger car engines fuelled by LPG or dual fuel system Gasoline/LPG.	Shell Helix Super LPG 15W-40 is suitable for use where the following specifications are called for:  API Service Classification SH/CG-4
<b>Shell Helix Super Older Engines 25W-60</b>  AUST ONLY  Heavy-duty high viscosity mineral oil for older engines	Shell Helix Super Older Engines 25W-60 is a quality lubricant based on a blend of high viscosity index mineral oils and selected additives.  It is blended to meet the all-year-round requirements of passenger car gasoline and diesel engines.	Gasoline engines – Naturally aspirated and turbocharged passenger car engines.  Diesel engines – Naturally aspirated and turbocharged passenger car engines.	Shell Helix Super Older Engines 25W-60 is suitable for use where the following specifications are called for:  API Service Classification SL/CF
<b>Shell Helix F 5W-30</b>  Synthetic technology engine oil providing complete protection and fuel efficiency for high performance engines	Shell Helix F 5W-30 is an engine oil designed specifically for applications, which require the use of fuel economy oils meeting modern US and European automotive industry specifications.	All naturally aspirated, fuel injected, turbocharged and multi-valve passenger car engines that permit the use of fuel economy oils, having a low viscosity in high temperature, high shear rate conditions. Oils meeting WSSM2C913A have a mandatory recommendation for the following Ford models:  <b>Petrol engines 99 Model Year onwards:</b> <ul style="list-style-type: none"><li>• Vehicles with 20,000km service interval</li><li>• Focus 1.4/1.6 Zetec-SE, 1.8/2.0 Zetec-E</li><li>• Mondeo 2001– 1.8/2.0 Duratec HE, 2.5 Duratec-VE</li><li>• Transit (8/98) – 2.0/2.3 DOHC</li></ul> <b>Diesel engines 99 Model Year onwards:</b> <ul style="list-style-type: none"><li>• Focus – 1.8 Endura-DI, 1.8 DuraTorq – TDCi</li><li>• Mondeo – 2.0 DuraTorq DI</li><li>• Transit – 2.0/2.4 DuraTorq DI</li></ul>	Shell Helix F 5W-30 meets the requirements of the following industry standards:  API Service Classification SJ ILSAC GF-2 ACEA A1 and B1 Ford Motor Co Approved against WSSM2C913A and WSSM2C913B

DIESEL ENGINE OILS			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Rimula Ultra XT 5W-40</b>  AUST ONLY  Ultimate quality super high performance synthetic diesel engine oil	Shell Rimula Ultra XT 5W-40 is a fully synthetic heavy-duty diesel engine oil developed especially to meet the requirements of North American designed engines.  The exclusive Shell formulation offers users exceptional performance and protection in combination with lower operating costs and enhanced fuel economy potential compared to conventional mineral oils.	Designed for US style engines – Diesel engines from North American manufacturers have some distinctive lubrication requirements compared to those of European or Japanese origin.  To provide the high performance and protection for Cummins, Caterpillar, Mack and Detroit Diesel engines, Shell scientists have developed Shell Rimula Ultra XT 5W-40– dedicated to US engines.	API Classification    API CH-4/ CG-4/CF-4/CF Cummins                CES 20076 (long drain)  Mack                      EO-M+ (long drain) Caterpillar                Meets requirements Detroit Diesel            Meets requirements  Shell Rimula Ultra XT is not recommended for engines where API CH-4/CG-4/CF-4/CF quality oils are not specified, e.g. Mercedes Benz and certain Japanese engines.  For ultimate protection and performance for these engines we recommend Shell Rimula Ultra 10W-40.
<b>Shell Rimula Ultra 10W-40</b>  Ultimate quality super high performance synthetic diesel engine oil	Shell Rimula Ultra 10W-40 fully synthetic heavy-duty diesel engine oil delivers no compromise durability and long oil life.  The performance has now been extended to cover most of new Euro IV engine requirements as well as high severity European heavy-duty engines.	Ultimate European Diesel Engine Oil Performance – Outstanding performance in automotive high-speed heavy-duty diesel engines built in Europe and particularly suited for use in DaimlerChrysler and MAN Euro III and Euro IV engines as well as exceeding the performance requirements of other European makers such as Volvo, DAF, Scania and Iveco.  Recommended for American and Japanese Engines – Rimula Ultra is recommended for use in Cummins, Mack and most Japanese engine types. Not recommended for Caterpillar engines.  Commercial Road Transport Operations – Designed for use in the latest highly rated turbocharged 4-stroke diesel engines under all operating conditions. Optimised for Euro III and Euro IV engine technology.	ACEA                      E4, E5, E7 API Classification    CF Cummins                CES 20077 DAF                        E4 Mercedes Benz        228.5 Mack                      EO-M Plus MAN                      M 3277 MTU                      Type 3 RVI                        RLD Scania                    LDF, LDF-2 Volvo                     VDS-2, VDS-3
<b>Shell Rimula D Extra 15W-40</b>  AUST ONLY  Premium high performance diesel engine oil	Shell Rimula D Extra 15W-40 is a premium high performance diesel engine oil for all heavy-duty diesel engines, on or off the highway.  This dedicated diesel formulation provides excellent diesel engine performance.	Wide range of turbocharged and non-turbocharged engines under normal operation. It is particularly recommended for use in older Mercedes Benz trucks and buses as well as for cost effective lubrication in off highway applications such as agricultural tractors.	API Classification    CG-4, CF-4 European ACEA       E2-96 Mercedes Benz        228.1 Volvo                    VDS MAN                     271

DIESEL ENGINE OILS (continued)			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Rimula Super 15W-40</b>  Super high performance diesel engine oil designed for US, European and Japanese engines	Shell Rimula Super 15W-40 has been formulated to meet needs of the latest low emission and high performance diesel engines from European, North American and Japanese engine makers.  Offering protection, longer oil life and compatibility with low-emission engine technology used in road transport, construction and other industries.	Severe Duty – Shell Rimula Super 15W-40 provides protection and performance in the latest high power heavy-duty diesel engines from Europe, US and Japanese manufacturers in both over-the-road and off-highway applications.  Shell Rimula Super 15W-40 uses exclusive additive technology to provide the optimum engine protection, reducing wear, soot thickening and corrosion in the severe environment of today’s Euro 4, US and Japanese emission controlled engines.  EGR Engines – Shell Rimula Super 15W-40 has been demonstrated to provide full protection and maximum oil life with the latest US 2002 EGR equipped engines.  Exhaust After Treatment Compatibility – Shell Rimula Super 15W-40 meets the requirements of Mercedes Benz, MAN and other OEMs for Euro III engines equipped with exhaust particulate traps and latest Euro IV engine without DPF.	ACEA                      E3, E5, E7 API                        CI-4, CI-4 Plus, CH-4, CG-4, CF-4, CF  Global                    DHD-1 Cummins                CES 20078 CES20071,2,6 and CES20077 DAF                        ACEA E3 Mack Truck            EO-M, EO-M+, EO-N Premium Plus 03 Caterpillar              ECF-1 MAN                      M 3275 Mercedes Benz        228.3 RVI                        RLD Scania                    E5 Volvo                     VDS-3 Scania                    ACEA E5
<b>Shell Rimula X 15W-40</b>  Extra high performance diesel engine oil	Shell Rimula X 15W-40 is a high performance dedicated heavy-duty engine lubricant designed for use in modern high-speed turbocharged diesel engines. They use exclusive additive formulations in conjunction with highly refined base oils to deliver longer life and enhanced protection relative to their predecessors.  Shell Rimula X 15W-40 has been formulated for severe duty service in engines specifically designed to meet Euro 3 on-highway exhaust emission standards as well as being suitable for a wide range of heavy-duty off-highway applications.	On-Highway Heavy-duty Trucks – As an integral part of the development of Shell Rimula X 15W-40, extensive testing of the product has been carried out in road haulage operations around the world confirming the performance of Rimula X in European, American and Japanese equipment under a wide range of haulage conditions.  Construction and Mining – Shell Rimula X 15W-40 is recommended for most engine types found in construction and mining equipment. It is particularly suitable for Caterpillar, Cummins, Detroit Diesel (4-cycle) and Komatsu engines.  It is formulated to provide continuous protection even where higher sulphur fuels are used.  Agricultural Equipment – Shell Rimula X 15W-40 is ideally suited for the stop-start service found in agricultural operation and protects against bearing wear and deposit formation even under high load low speed conditions when other oils can fail.	API Classification    CH-4/CG-4 CF-4/CF ACEA                      E3, E5 JASO                      DH-1 Cummins                CES 200-71, -72, -76  Cummins                CES 200-75 (BandC Series) Mack                      EO-M Plus MAN                      3275 Mercedes Benz        228.3 RVI                        RD Scania                    E3 Volvo                     VDS-2 GM Allison            C-4

ENGINE OILS – PASSENGER CARS

ENGINE OILS – PASSENGER CARS

ENGINE OILS – PASSENGER CARS

DIESEL ENGINE OILS (continued)				
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS	
<b>Shell Rimula M 15W-40</b>  High performance diesel engine oil	Shell Rimula M 15W-40 is a high quality, high performance diesel engine oil for naturally aspirated and moderately turbocharged heavy-duty diesel engines.	Off-highway, eg. construction or agricultural equipment.  Light/medium duty long distance trucking and similar ‘constant speed’ on road operations.	API Classification	CF-4/SG
<b>Shell Rimula X 30</b>  High performance diesel engine oil	Shell Rimula X 30 monograde oils are high quality heavy-duty engine lubricants designed for use in diesel engines where monograde oils are specified.	Dedicated diesel engine oil performance – Shell Rimula X 30 monogrades have been formulated to provide robust engine performance in a variety of off-highway applications or older on-highway diesel vehicles.  Construction Industry application – Engine oil technology is sometimes specified for use in the transmission and hydraulic applications. Shell Rimula X 30 monogrades offer premium performance and protection for these applications.  Stationary Equipment – Shell Rimula X 30 monogrades are suitable for certain stationary equipment, such as pumps, that run continuously under steady state conditions.	API Classification Mercedes Benz MAN Mack Truck MTU Caterpillar	CF 228.0 270 EO-K/2 Type 1 TO-2
<b>Shell Rimula X 40</b>  High performance diesel engine oil	Shell Rimula X 40 monograde oils are high quality heavy-duty engine lubricants designed for use in diesel engines where monograde oils are specified.	Dedicated diesel engine oil performance – Shell Rimula X 40 monogrades have been formulated to provide robust engine performance in a variety of off-highway applications or older on-highway diesel vehicles.  Construction Industry application – Engine oil technology is sometimes specified for use in the transmission and hydraulic applications. Shell Rimula X 40 monogrades offer premium performance and protection for these applications.  Stationary Equipment – Shell Rimula X monogrades are suitable for certain stationary equipment, such as pumps, that run continuously under steady state conditions.	ACEA API Classification Mercedes Benz MAN MTU Caterpillar	E2 CF 228.0 270 Type 1 TO-2
<b>Shell Rimula D 15W-40</b>  High quality diesel engine oil	Shell Rimula D 15W-40 is a High quality High Performance Diesel Engine Oil for naturally aspirated and moderately turbo-charged Heavy-duty Diesel Engines, particularly engines used in agriculture and road transport.	High-speed, naturally aspirated and moderately rated turbocharged units. Although not designed specifically for four-stroke gasoline engines they may be used for this purpose, in certain cases, eg. Old fleets with mixed engines.	API Classification	CF/SF

ENGINE OILS – PASSENGER CARS

DIESEL ENGINE OILS (continued)				
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS	
<b>Shell Rotella DD+</b>  40 50  Quality diesel engine oil for Detroit Diesel 2-stroke engines	Shell Rotella DD+40 and DD+50 are a high performance, heavy-duty engine oil designed specifically for all 2-stroke diesel engines manufactured by Detroit Diesel Corporation.	Detroit Diesel 2-stroke engines – Suitable for all Detroit Diesel 2-stroke engines, in all applications including ‘149’ engines used in mine haul trucks.  Certain 4-cycle engines – DD+40 can be used in certain 4-cycle engines in off-highway applications.  Heavy-duty Diesel Engines – Rotella DD+50 is also suitable for general purpose use in non- turbocharged and moderately rated turbocharged heavy-duty diesel engines on and off-highway.	API Service Classification  Detroit Diesel Corporation	CF-II/CF  7SE 270 8810 (Sulphated Ashless than 0.8%) All equipment
<b>Shell S 7294 Oil</b>  AUST ONLY  Running in and preservative diesel engine oil	Shell S 7294 Oil is a heavy-duty running-in and protective oil for diesel engines. It is suitable for both normally aspirated and turbocharged engines.	Running-in and internal corrosion protection during storage and shipping of High-speed and Medium-speed diesel engines.  Shell S 7294 Oil can also be used for the internal protection of gearboxes and final drive units whilst in storage.	US Military API NATO BWV FZG	MIL-L2104B CC C-642 TL 9150 0037/3 Fail Stage 10
DIESEL ENGINE OILS – OFF HIGHWAY				
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS	
<b>Shell Rimula MV 15W-40</b>  High performance diesel engine oil for mining, construction and truck engines	Shell Rimula MV 15W-40 is the latest technology diesel engine oil specially formulated to meet the ever more demanding needs of the high performance diesel engines found in off-highway applications such as construction mining and quarrying.  Shell Rimula MV 15-40 is especially suited for use in Caterpillar, Cummins and MTU engines.	Off-highway Applications – Shell Rimula MV 15W-40 is especially designed to provide no compromise protection for the leading brands of heavy-duty diesel engine found in severe duty off-highway equipment, and meets the latest specifications from Caterpillar and Cummins.  The advanced formulation of Shell Rimula MV 15W-40 offers increased performance and protection for the US 2002/Euro3 low emission engines compared to previous generation oils. It also offers increased compatibility with engine fitted with particulate traps where conventional high ash Super High Performance Diesel Engine Oils can result in particulate filter blockage.	API  ACEA Caterpillar Cummins Mack Truck MTU	CI-4/CH-4/CG-4 CF-4/CF E3 ECF-I CES 20071,72,78 EO-M Plus Type 2 approved (All engines)
AGRICULTURAL ENGINE OILS				
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS	
<b>Shell Harvella T 15W-40</b>  Multipurpose tractor oil	Shell Harvella T 15W-40 are ‘Super Tractor Oil Universal’ (STOU) oils designed for use in a wide variety of modern agricultural equipment.  They are a blend of high viscosity index base oils and an advanced additive package designed to give reliable performance in a wide range of farming applications.	Universal performance – Suitable for most types of diesel and gasoline agricultural engine and tractor transmission/hydraulic systems. Also suitable for many other applications around the farm including: <ul style="list-style-type: none"><li>Oil immersed brakes</li><li>Powershift transmissions</li><li>Hydraulics</li><li>Power steering systems</li><li>Hydrostatic transmissions</li><li>Conventional gear drive systems</li></ul>	API Classification  CCMC Ford Massey-Ferguson Mercedes Benz  New Holland  John Deere Caterpillar ZF	CF-4/SF GL-4 (Low speed, high torque requirements) D-4 M2C-159B M1139/M1144 227.1 (Meets requirements) 82009201 (Meets requirements) JDM J27 CAT TO2 TE-ML 06



AUTOMATIC TRANSMISSION FLUIDS

PASSENGER CAR AUTOMATIC TRANSMISSION FLUIDS			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Helix ATF XTR</b>  Automatic transmission fluid	Specifically developed for use In Ford 4-Speed Automatic Transmissions	Shell Helix ATF XTR is a specially formulated 4-Speed Automatic Transmission Fluid (ATF) approved as service fill for the Ford 4-speed automatic transmissions made by BTR (both the 95LE in V8 and the 85LE in 6 cylinder models). Shell Helix XTR ATF takes full advantage of Shell's XHVI technology in providing a superior product.  Shell Helix ATF XTR is not recommended for use in any other transmissions other than 4-speed Ford ATF.  Note: Although Shell Helix ATF XTR has specifications satisfying the requirements of Dexron II, it is not a Dexron II qualified product. It was formulated to meet the frictional requirements of the 85/95 LE transmissions, which are at the low end of the Dexron II frictional properties. Shell Helix ATF XTR should only be recommended for Ford 4-Speed Automatic Transmission.	Approved service fill for:  85LE (Used with the 6 Cylinder Engine)  95LE (Used with the V8 Engine)
<b>Shell Donax TX</b>  Top tier fully synthetic automatic transmission fluid	Shell Donax TX is a superior quality automatic transmission fluid fully approved by General Motors to meet their GM DEXRON III specification.  Based on Shell XHVI synthetic base fluid, Shell Donax TX is the ultimate performance automatic transmission fluid allowing extended drain intervals even under the most severe conditions.	<ul style="list-style-type: none"><li>• Passenger car and heavy-duty automatic transmissions.</li><li>• Automotive hydraulic systems.</li><li>• Power steering systems where an automatic transmission fluid is recommended.</li><li>• Certain manual transmissions.</li></ul>	Ford General Motors  ZF TE-ML  Voith MB MAN  MERCON Allison C-4 Approved 03D-04D-09-14B 16L-17C 55.6336 (ex G1363) 236.9 339 F  Fulfills GM former IIIIG specification

AUTOMATIC TRANSMISSION FLUIDS

OTHER AUTOMATIC TRANSMISSION FLUIDS			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell ATF IIIIG</b>  Premium automatic transmission fluid	Shell ATF IIIIG is a premium quality automatic transmission fluid based on high viscosity index mineral oils and carefully selected additives.  It is blended to meet the stringent requirements of leading automotive transmission manufacturers.	<ul style="list-style-type: none"><li>• Passenger car automatic transmissions.</li><li>• Heavy-duty automatic transmissions.</li><li>• Power steering units.</li><li>• Certain hydraulic applications calling for oils meeting ISO VG 32-46-68 viscosity requirements.</li></ul>	Ford General Motors General Motors  MERCON Allison C-4 Fulfills the requirements of the former GM IIIIG
<b>Shell ATF IID</b>  AUST ONLY  Automatic transmission fluid	Shell ATF IID is based on imported high viscosity index paraffinic oils and carefully selected additives.  It is blended to meet the stringent requirements of leading automotive transmission manufacturers.	<ul style="list-style-type: none"><li>• Passenger car automatic transmissions in passenger vehicles, buses and heavy-duty off-road machinery.</li><li>• Due to its excellent low temperature performance, ATF II meets the performance requirements for pump lubrication in hydraulics systems.</li><li>• It is recommended for automatic transmission refill in General Motors, Chrysler, American Motors and other vehicles, in models between 1980 and 1981.</li><li>• ATF II is also recommended for Caterpillar transmissions where an SAE 10W is specified.</li></ul>	ATF II meets the performance requirements of the following specifications:  General Motors Caterpillar Mercedes Benz  Allison C-4 (approved fluid) TO-2 236.6 listing
<b>Shell ATF XTR</b>  Automatic transmission fluid	Specifically developed for use In Ford 4-speed Automatic Transmissions	Shell ATF XTR is a specially formulated 4-Speed Automatic Transmission Fluid (ATF) approved as service fill for the Ford 4-speed automatic transmissions made by BTR (both the 95LE in V8 and the 85LE in 6 cylinder models). Shell XTR ATF takes full advantage of Shell's XHVI technology in providing a superior product.  Shell ATF XTR is not recommended for use in any other transmissions other than 4-speed Ford ATF.  Note: Although Shell ATF XTR has specifications that satisfy the requirements of Dexron II, it is not a Dexron II qualified product. It was formulated to meet the frictional requirements of the 85/95 LE transmissions, which are at the low end of the Dexron II frictional properties. Shell ATF XTR should only be recommended for Ford 4-speed Automatic Transmissions.	Approved Service Fill for:  85LE (Used with the 6 Cylinder Engine)  95LE (Used with the V8 Engine)

AUTOMATIC TRANSMISSION FLUIDS

OTHER AUTOMATIC TRANSMISSION FLUIDS (continued)				
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS	
<b>Shell Donax TF</b> Automatic transmission fluid	Shell Donax TF is a premium quality automatic transmission fluid, specially formulated to meet the lubrication requirements of specific automatic transmission units. It is based on a blend of high viscosity index oils and proven additives, to provide long-term protection in units requiring a non-friction modified type fluid.	<ul style="list-style-type: none"><li>Automatic transmission systems requiring a fluid of this type.</li><li>Power steering units.</li></ul>	Ford  Borg Warner	SQM-2C 9007-AA Recommended Ford (service fill) M2C 33F, -33G Recommended for some units (for initial fill, service-fill and top-up)
<b>Shell Donax TM</b> Automatic transmission fluid	Shell Donax TM is a high quality automotive transmission, power steering and hydraulic oil mainly used for heavy-duty vehicles working in an 'off-road' environment.	<ul style="list-style-type: none"><li>Powershift and Industrial torque convertors.</li><li>Applications calling for a GM Type 'A' Suffix 'A' performance fluid.</li><li>Automatic transmission and power steering fluid used in heavy trucks and off-road vehicles.</li><li>Hydraulic oil for certain off-road applications.</li></ul>	General Motors Type 'A' General Motors Allison Mercedes Benz MAN	Suffix 'A' C-4 Sheet 236.2, 236.5 339 Type A
<b>Shell Transmission Fluid TDX</b> AUST ONLY High performance transmission fluid	Shell Transmission Fluid TDX was developed to meet the markets and OEM's requirements for a transmission fluid that could satisfy increased drain intervals, improved reliability and lower maintenance costs.  Shell Transmission Fluid TDX combines the exceptional performance features of the best synthetic base oil with the proven frictional and anti wear characteristics of premium transmission fluids.  Shell Transmission Fluid TDX has been developed to provide extended drain intervals and performance far exceeding that of conventional fluids.	Controlled Start Transmissions (CSTs) used in mining conveyor systems.	API Classification Dodge – CST	GL3 Approved for use in all Dodge CSTs in Australia

GEAR AND DIFFERENTIAL OILS

PASSENGER CAR GEAR AND DIFFERENTIAL OILS				
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS	
<b>Shell Helix Synthetic Gear 75W-90</b>  High performance automotive gear oil	Shell Helix Synthetic Gear 75W-90 is a high performance gear oil for modern manual transmissions.  The carefully balanced additive system forms a fill for life lubricant even in the most severe applications.  Shell Helix Synthetic Gear 75-90W has a balance of viscosity and frictional properties, which ensure good shift feel and fast gear change.	Shell Helix Synthetic Gear 75W-90 is recommended for use in front wheel drive gearboxes and other critical manual transmissions where an SAE 75W-90 gear oil is specified.  Especially suited to 5-speed transmissions fitted in Holden Commodore.	BTR Falcons  Commodores  API Classification	5M-49 Approved for use in T5 transmissions Approved for use in T5 transmissions GL 5, PG2
<b>Shell Helix Gear Oil 80W</b>  AUST ONLY High performance manual gearbox oil	Shell Helix Gear Oil 80W is a long life gearbox oil designed to give new benefits based on improved levels of performance to meet the future requirements of gearboxes.  Specially optimised mineral base oils and new additive technology improve lubrication of the drive train and potentially extend oil drain intervals.	Automotive transmissions – Synchromesh gearboxes and medium loaded axle drives.	API Service Classification Eaton (ex US) Isuzu Ford Borg Warner Mitsubishi	GL-4 Meets Meets ESP-M2C83-C 5M-42 ES-X-64021
<b>Shell Helix LSD 90</b>  Gear oil for conventional and limited slip differentials	Shell Helix Limited Slip Differentials (LSD) 90 is a lubricant formulated for differentials for all cars, requiring use of SAE90 oil both with and without "Limited Slip" design.  It offers outstanding protection against gear wear, helping to prevent premature failure.  The controlled frictional properties of Shell Helix LSD 90 also ensure optimal operation of Limited Slip Differentials.  Note: Shell Helix LSD 90 is not approved for use in the differentials of the following cars: <ul style="list-style-type: none"><li>Ford Falcon/Fairmont/Fairlane/LTD with 5.0L, 8 cylinder engines (Models since 1991)</li><li>Ford Falcon XR6 (Models since 1992)</li><li>Holden Commodore/Calais/Statesman/Caprice with 5.0L, 8 cylinder engines (Models since 1988)</li></ul>	Shell Helix LSD 90 is formulated for maximum protection of limited slip differentials fitted in hardworking passenger cars and light commercial vehicles.  Shell Helix LSD 90 is recommended for final drives equipped with either multi-plate or cone slip limiting devices.	API Performance	Exceeds GL5
<b>Shell Helix Diff 80W-90</b>  AUST ONLY Automotive gear oil	Shell Helix Diff 80W-90 is an extreme pressure; heavyduty lubricant recommended for hypoid or spiral bevel axles, gears and steering boxes of automotive equipment requiring a SAE 80W-90 oil.	Shell Helix Diff 80W-90 is recommended for all non-limited slip differentials as fitted in light commercial or passenger vehicles, requiring an SAE 80W-90 oil.	API	GL4, GL5
<b>Shell XGO 75W-90</b>  High performance automotive gear oil	High performance gear oil for modern manual transmission.	Shell XGO 75W-90 is a high performance gear oil for modern manual transmissions. The carefully balanced additive system forms a fill for life lubricant even in the most severe applications.  Shell XGO 75W-90 has a balance of viscosity and frictional properties, which ensure good shift feel and fast gear change.	BTR Falcons  Commodores  API	5M-49 Approved for use in T5 transmissions Approved for use in T5 transmissions GL 5, PG2

OTHER PASSENGER CAR GEAR AND DIFFERENTIAL OILS			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Spirax GX 80W</b>  High performance manual gearbox oil	Shell Spirax GX 80W are long life gearbox oils designed to give new benefits based on improved levels of performance to meet the future requirements of gearboxes.  Specially optimised mineral base oils and new additive technology improve lubrication of the drive train and potentially extend oil drain intervals.	Automotive transmissions – Synchronesh gearboxes and medium loaded axle drives.	API Service Classification      GL-4 Mercedes Benz Sheet 235.5 MAN                              341 ML Eaton (ex US)                Meets Isuzu                              Meets ZF TE-ML                      02B 17A
<b>Shell Spirax GX 80W-90</b>  High performance gear oil	Shell Spirax GX 80W-90 are long life gearbox oils designed to give new benefits based on improved levels of performance to meet the future requirements of gearboxes.  Specially optimised mineral base oils and new additive technology improve lubrication of the drive train and potentially extend oil drain intervals.	Automotive transmissions – Synchronesh gearboxes and medium loaded axle drives.	API Service Classification      GL-4 MAN                                41 ML ZF TE-ML                        02B-016A Eaton (ex US)                Meets Isuzu                                Meets
<b>Shell Spirax AX LS 90</b>  AUST ONLY  Severe duty axle oil for limited slip differentials	Shell Spirax AX LS 90 is blended for use in a heavy-duty on-road and off-road axle units with limited slip differentials.  Specially selected additives impart good anti-wear, anti-rust characteristics, oxidation and thermal stability as well as the required coefficient of friction to meet requirements of limited slip differentials.  State of the art sulphur phosphorous EP additives help ensure excellent anti-wear properties, and friction modifiers specially designed for limited slip axles will ensure no stick-slip and quiet operation.	Automotive transmissions – Suitable for heavy-duty vehicles, including construction machines or buses and on-road and off-road commercial vehicles.	API Service Classification      Exceeds GL-5 (and former GL-6)  US Military                      MIL-L2105B
<b>Shell Spirax ALS 90</b>  Heavy duty axle oil for limited slip differentials	Shell Spirax ALS 90 is blended for use in a wide variety of automotive axle units with limited slip differentials.  Suitable for heavy-duty vehicles, including construction achines or buses, and passenger cars, which are fitted with limited slip differentials.  Specially selected additives impart good anti-wear, anti-rust characteristics, oxidation and thermal stability as well as the required coefficient of friction to meet requirements of limited slip differentials	Automotive transmissions – Suitable for heavy-duty vehicles, including construction machines or buses, and passenger cars which are fitted with limited slip differentials.	API Service Classification      GL-5

OTHER PASSENGER CAR GEAR AND DIFFERENTIAL OILS (continued)			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Transaxle 75W-90</b>  Synthetic high performance gear oil	Shell Transaxle 75W-90 is particularly designed to fulfil the highest requirements of extremely loaded passenger car drive train systems.	Transaxle transmissions – Heavily loaded “transaxle” transmission where hypoid axle and gearbox are in the same housing and lubricated by the same product. Particularly in sport passenger car drive train systems.  Automotive transmissions – Heavily loaded axle drives, synchronised and non-synchronised gearboxes.	API Service Classification      GL-4/5 Ferrari                            Approved Porsche                        Approved  Meets the requirements of further sport car transaxle transmissions.
<b>Shell Transmission MA 75W-90</b>  Synthetic high quality gearbox oil	Shell Transmission MA 75W-90 is a fully synthetic gearbox oil designed to fulfill the latest Mercedes Benz heavy-duty transmission requirements.	Heavy-Duty Gearboxes – Fitted with synchronesh, in particular for those working under very severe load and operation conditions and therefore where the oil temperature is usually high.  This product is particularly designed to meet the latest Mercedes Benz heavy-duty transmission requirements and can be used where this manufacturer recommends an approved lubricant according to the Sheet 235.11.  Automotive Transmissions – Shell Transmission MA 75W-90 can also be recommended for passenger car gearboxes including Transaxle design.	API Service Classification      GL-4 Mercedes Benz Sheet    235.11

HEAVY-DUTY GEARBOX AND DIFFERENTIAL OILS			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Spirax S</b>  75W-90 80W-140  Premium heavy-duty fully synthetic gear oil	Shell Spirax S products are blended using synthetic base stocks to give optimal performance in a wide variety of automotive axle units subjected to heavy-duty conditions.	<ul style="list-style-type: none"><li>Heavy-duty hypoid axles/differentials.</li><li>Other automotive transmission units operating under high speed/shock load, high speed/low torque and low speed/high torque conditions.</li><li>Lubricants used in conjunction with Eaton and Meritor extended warranties.</li><li>Transfer cases for automobiles, light and heavy-duty trucks, farm equipment and heavy construction equipment.</li><li>Conventional manual transmissions where the manufacturer specifies an API GL-5 oil.</li></ul>	It may be used in any application where the following performance is specified:  MIL-PRF-2105E API GL5 API MT-1  Meritor Automotive 0-76-E (Petrol) 0-76-N (syn.) (75W-90)  MACK GO-J+ (75W-90) GO-J (80W-140)  Dana Corporation, Axle Division <ul style="list-style-type: none"><li>SHAES 256</li><li>SHAES 254</li><li>Eaton Axle Division<ul style="list-style-type: none"><li>PS-163 (E500 – 500,000 mile drain interval Roadranger Extended Warranty)</li><li>PS-037 (E250 – 250,000 mile drain interval Roadranger Extended Warranty)</li><li>PS-109 (obsolete)</li></ul></li><li>General Electric D50E9C</li><li>Harnischfeger (PandH) 474</li><li>Navistar TMS 6816</li></ul>
<b>Shell Spirax GSX 50</b>  Heavy-duty synthetic gear oil	Shell Spirax GSX 50 is blended using synthetic base stocks to give optimal performance in heavy-duty truck manual transmissions.  It is a “straight mineral” or non-extreme pressure oil.	Extended drain intervals and severe service heavy-duty class 6, 7 and 8 manual transmissions.  Oil lubricated wheel bearings on tractors and trailers.	<ul style="list-style-type: none"><li>Eaton (Dana/Spicer) and Meritor (formally Rockwell) for extended drain/warranty applications (750,000 mile transmission warranty coverage (Rockwell with 500,000 mile factory fill and Eaton 500,000 mile service fill change intervals)</li><li>API MT-1 performance requirements</li><li>Eaton Transmission Division<ul style="list-style-type: none"><li>PS-164 (E500 – 500,000 mile drain interval Roadranger Extended Warranty)</li><li>PS-081 (E250 – 250,000 mile drain interval Roadranger Extended Warranty)</li></ul></li><li>Mack TO-A Plus</li><li>Meritor Automotive, Inc (formerly Rockwell International) 0-81 (syn.)</li><li>Navistar TMS 6816</li><li>US Military MIL-L-2104E, MIL-L 46152D</li></ul>
<b>Shell Spirax MT 80W-90</b>  Premium heavy-duty axle oil	Shell Spirax MT 80W-90 is specifically designed for heavy-duty applications such as heavy haulage and long distance trucking.  They may be used in a wide variety of automotive axle units and certain heavy-duty manual transmissions units. Shell Spirax MT 80W-90 is especially suited and approved for use in heavy-duty Mack transmissions and axles.	Automotive Transmissions – Shell Spirax MT 80W-90 is suitable for most heavy-duty hypoid axles applications particularly those operating under high speed/ shock load, high speed/low torque and low speed/high torque conditions.  Manual Gearboxes – Shell Spirax MT 80W-90 can be used in non-synchronised heavy-duty manual gearboxes, such as those manufactured by Eaton, Mack, Meritor etc. Shell Spirax MT 80W-90 should not be used in synchronised manual gearboxes.	API Service Classification GL-5/MT-1  Mack GO-J

HEAVY-DUTY GEARBOX AND DIFFERENTIAL OILS (continued)			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Spirax ASX</b>  70W-90 75W-140 – NZ ONLY	Shell Spirax ASX products are a unique fuel-efficient, long life axle oil designed to give the ultimate in protection for the latest heavy-duty axles.  Specially formulated synthetic base oils combined with an additive technology unique to Shell give improved lubrication of the drive train, lower operating temperatures and longer life for your equipment.  Available in 75W-90 and 75W-140 versions.	Automotive transmissions.  Heavily loaded axle drives and non-synchronised transmissions where mineral and synthetic gear oils are recommended.	API Service Classification GL-5, MT-1 Scania STO 1:0 (extended drain)
<b>Shell Spirax AX</b>  80W-90 85W-140  Super high performance axle oil	Shell Spirax AX products are long life axle oils designed to give new benefits based on improved levels of performance to meet the future requirements of drivelines.  Specially optimised mineral base oils and new additive technology improve lubrication of the drive train and potentially extend oil drain intervals.	Automotive transmissions.  Heavily loaded axle drives and non-synchronised transmissions.	API Service Classification GL-5 US Military MIL-L-2105D MAN 342 ML  <b>Spirax AX 80W-90</b> Mercedes Benz 235.6 ZF TE-ML 05A, 07A,16C,17B  <b>Spirax AX 85W-140</b> ZF TE-ML 05A, 07A,16D,17B
<b>Shell Spirax A</b>  80W-90 85W-140  Heavy-duty automotive gear oil	Shell Spirax A products are blended for use in a wide variety of automotive axle units subjected to heavy-duty conditions.  Specially selected additives impart good anti-wear, anti-rust characteristics and oxidation stability.	Automotive transmissions. <ul style="list-style-type: none"><li>Heavy-duty hypoid axles.</li><li>Other automotive transmission units operating under high speed/shock load, high speed/low torque and low speed/high torque conditions.</li></ul>	API Service Classification GL-5
<b>Shell Dentax 90</b>  AUST ONLY  Automotive mineral gear oil – Non EP	Shell Dentax 90 is high quality, straight mineral oils intended for certain automotive transmissions.	<ul style="list-style-type: none"><li>Manually operated gearboxes</li><li>Spiral-bevel and worm axles – Use where gear loadings are relatively mild and extreme-pressure oils are not required.</li></ul> Not recommended for heavy-duty transmission applications.	API Service Classification GL-1



AGRICULTURAL GEAR OILS			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Donax TD 5W-30</b>  Universal tractor transmission oil	<p>Premium “universal tractor transmission oils” (UTTO) designed for use in transmissions, hydraulic systems, oil immersed brakes and other ancillary systems fitted to agricultural tractors and off-road equipment.</p> <p>Shell Donax TD 5W-30 is recognised by leading agricultural equipment manufacturers and suitable for use in most modern equipment.</p>	<p>Agricultural Tractors Transmissions – Shell Donax TD 5W-30 have been evaluated against the latest requirements of leading tractor and transmission manufacturers including John Deere, Massey Ferguson, Ford-New Holland and GM Allison.</p> <p>Hydraulic Systems – Shell Donax TD 5W-30 is ideally suited for hydraulic systems of tractors and ancillary equipment. Shell Donax TD formulated using specially selected additives and high quality base oils to provide good low temperature fluidity and wear protection.</p> <p>Oil Immersed Brakes – Special friction modifying additives are included in Shell Donax TD 5W-30 to ensure optimum performance of oil immersed brakes whilst minimising brake noise. Shell Donax TD 5W-30 are recommended for most wet brake systems fitted to agricultural tractors.</p>	<p>API Gear Performance API GL-4 Ford New Holland M2C-134D John Deere JDM-J20C Massey-Ferguson M1135 Volvo WB 101 ZF TE-ML 03E, 05F Caterpillar TO-2 Komatsu Recommended for use in certain construction equipment MS1207</p> <p>CASE</p> <p>Shell Donax TD 5W-30 can be used when a SAE J 306 80W grade is recommended.</p>
<b>Shell Donax TD 10W-30</b>  Universal tractor transmission oil	<p>Premium “universal tractor transmission oils” (UTTO) designed for use in transmissions, hydraulic systems, oil immersed brakes and other ancillary systems fitted to agricultural tractors and off-road equipment.</p> <p>Shell Donax TD 10W-30 is recognised by leading agricultural equipment manufacturers and suitable for use in most modern equipment.</p>	<p>Shell Donax TD 10W-30 is recommended for use in all Caterpillar Final Drive and Axles that currently specify the use of Cat FD-1 fluids.It can also be used in transmissions requiring TO-4 fluids that do not contain friction material. It is not recommended for final drives which contain brakes.</p> <p>It should also not be used in engines, transmissions or hydraulic systems.</p> <ul style="list-style-type: none"><li>• Axles</li><li>• Final drives</li></ul>	<p>API Gear Performance API GL-4 Ford New Holland M2C-134D John Deere JDM-J20C Massey-Ferguson M1143 Volvo WB 101 ZF TE-ML 03E, 05F Caterpillar TO-2 Komatsu Recommended for use in certain equipment MS1207</p> <p>CASE</p> <p>Shell Donax TD 10W-30 can be used when a SAE J 306 85W grade is recommended.</p>

OTHER TRANSMISSION OILS			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Donax TC 10W</b>  Premium transmission oil developed to meet caterpillar to-4 requirements	<p>Shell Donax TC 10W is designed to provide operators with trouble free operation and maximum reliability for the lifetime of the equipment.</p> <p>Shell Donax TC 10W meets the demanding requirements of modern transmission, final drive, oil immersed brake and hydraulic systems fitted to heavy-duty off-highway vehicles.</p>	<p>Shell Donax TC 10W is recommended for use in heavy duty off-highway equipment produced by the world’s leading manufactures including; Caterpillar, Komatsu, Komatsu-Dresser and in transmissions manufactured by Eaton, Eaton Fuller, ZF, Dana, Rockwell amongst other:</p> <ul style="list-style-type: none"><li>• Powershift Transmissions</li><li>• Final drives</li><li>• Immersed brakes</li><li>• Hydraulic systems</li></ul>	<p>Caterpillar TO-4 General Motors Allison C-4 Komatsu Service fill approved KES 07.868.1 ZF TE-ML 03C API Classification CF, GL-1, 2, and 3</p>
<b>Shell Tegula V 32</b>  AUST ONLY  Advanced technology oil for hydrodynamic transmissions	<p>Shell Tegula V 32 is an advanced technology oil designed to meet the latest requirements of variators and advanced railway transmission systems combining hydrodynamic couplings and torque converters with mechanical gears.</p>	<ul style="list-style-type: none"><li>• Railway hydrodynamic transmission systems – Transmission systems for railway diesel engines consist of various combinations of fluid couplings, torque converters and transmission gears. This type of transmission is used in combination with a hydrodynamic brake, which is operated to reduce brake shoe wear during periods of prolonged braking down long slopes. At times, the brake oil temperature may reach up to 140°C.</li><li>• Gears and PIV variator lubrication</li></ul>	<p>Voith 3.285-149 (for use in Voith Power Transmissions).</p> <p>Shell Tegula V 32 is approved and recommended by Voith Turbo, PIV and Lenze.</p>
<b>Shell Rimula X 10W</b>  Mobile plant SAE 10W hydraulic fluid	<p>Shell Rimula X 10W monograde oils are high quality heavy-duty engine lubricants designed for use in hydraulic systems requiring a SAE 10W oil.</p>	<p>Dedicated diesel engine oil performance – Shell Rimula X 10W monogrades have been formulated to provide robust engine performance in a variety of off-highway applications or older on-highway diesel vehicles.</p> <p>Construction Industry application – Engine oil technology is sometimes specified for use in the transmission and hydraulic applications. Shell Rimula X 10W monogrades offer premium performance and protection for these applications.</p> <p>Stationary Equipment – Shell Rimula X 10W monogrades are suitable for certain stationary equipment, such as pumps, that run continuously under steady state conditions.</p>	<p>API Classification CF Caterpillar TO-2</p>

OTHER TRANSMISSION OILS (continued)			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Donax TC 30</b>  Transmission oil for heavy-duty off highway transmissions	Shell Donax TC 30 is designed to provide operators with trouble free operation and maximum reliability for the lifetime of the equipment.  Shell Donax TC 30 meets the demanding requirements of modern transmissions and oil-immersed brakes fitted to heavy-duty off-highway.	Shell Donax TC 30 is recommended for use in heavy-duty off-highway equipment produced by the world's leading manufacturers including; Caterpillar, Komatsu, Komatsu-Dresser and in transmissions manufactured by Eaton, Eaton Fuller, ZF, Dana, Rockwell amongst others. <ul style="list-style-type: none"><li>• Powershift Transmissions</li><li>• Final drives</li><li>• Immersed brakes</li><li>• Hydraulic systems</li></ul>	Shell Donax TC 30 is suitable for use where the following specifications are called for:  API Classification      CF Caterpillar Tractor      TO-4 GM / Allison              C-4 Komatsu                    KES 07.868.1 ZF                            TEMPL 03C Gears                        API GL-3
<b>Shell Donax TC 50</b>  Transmission oil for heavy-duty off highway transmissions	Shell Donax TC 50 are designed to provide operators with trouble free operation and maximum reliability for the lifetime of the equipment.  Shell Donax TC 50 meets the demanding requirements of modern transmissions, final drive and oil-immersed brakes fitted to heavy-duty off-highway.	Shell Donax TC 50 is recommended for use in heavy-duty off-highway equipment produced by the world's leading manufacturers including: Caterpillar, Komatsu, Komatsu-Dresser and in transmissions manufactured by Eaton, Eaton Fuller, ZF, Dana, Rockwell amongst others. <ul style="list-style-type: none"><li>• Powershift Transmissions</li><li>• Final drives</li><li>• Immersed brakes</li><li>• Hydraulic systems</li></ul>	Shell Donax TC 50 is suitable for use where the following specifications are called for:  API Classification      CF Caterpillar Tractor      TO-4 Komatsu                   KES 07.868.1 Gears                        API GL3
<b>Shell Donax TC 60</b>  Transmission oil for heavy-duty off highway transmissions	Shell Donax TC 60 is designed to provide operators with trouble free operation and maximum reliability for the lifetime of the equipment.  Shell Donax TC 60 meets the demanding requirements of modern final drive and oil-immersed brakes fitted to heavy-duty off-highway vehicles.	Shell Donax TC 60 is recommended for use in heavy duty off-highway equipment produced by the world's leading manufacturers including; Caterpillar, Komatsu, Komatsu-Dresser and in transmissions manufactured by Eaton, Eaton Fuller, ZF, Dana, Rockwell amongst others. <ul style="list-style-type: none"><li>• Powershift Transmissions</li><li>• Final drives</li><li>• Immersed brakes</li><li>• Hydraulic systems</li></ul>	Caterpillar                  TO-4 API                            CF Gears                        API GL-3
<b>Shell Donax CFD 60</b>  AUST ONLY  Premium quality off-highway final drive and axle oil	Shell Donax CFD 60 is a dedicated final drive and axle oil which offers significantly improved protection for gears and bearings in bevel gears, differentials, final drives and axles, and meets Cat FD-1 final drive axle oil (FDAO) specification.  Shell Donax CFD 60 has been developed for continuous use in extreme ambient temperatures in off road vehicles.	Shell Donax CFD 60 is recommended for use in all Caterpillar Final Drive and Axles that currently specify the use of Cat FD-1 fluids. It can also be used in transmissions requiring TO-4 fluids that do not contain friction material.  It is not recommended for final drives, which contain brakes. It should also not be used in engines, transmissions or hydraulic systems. <ul style="list-style-type: none"><li>• Axles</li><li>• Final drives</li></ul>	Shell Donax CFD 60 is suitable for use where the following specifications are called for:  Caterpillar                  FD-1 or where CAT FD-1                            (FDAO) is specified

BRAKE FLUID			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Brake and Clutch Fluid – Dot 4 Super</b>  Premium glycol type fluid for disc and drum brakes and clutch systems	Shell Brake and Clutch Fluid – Dot 4 Super is a premium quality brake and clutch fluid with a minimum boiling point of 230°C [446°F].	High Boiling point hydraulic brake fluid recommended for disc and drum brake system and hydraulic clutch systems in automotive, motorcycle and commercial vehicles.	Exceeding SAE J1703 and United States Federal Motor Vehicle Safety Standard Nr.116 DOT 3 and DOT 4 and ISO 4925 specifications.
CARE CARE			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Tyre Shine</b>  AUST ONLY	Cleans, conditions and protects tyres, mudflaps, hoses etc. Contains special self-spreading agents to ensure smooth, new-tyre look.	Shell Tyre Shine is a high-tech product that can create an elegant smooth new sheen on most automotive surfaces – tyres, mud flaps, door and window rubbers, hoses and bumper bars.	Solvent based silicone.
POWER STEERING FLUID			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Helix Power Steering</b>  AUST ONLY	Shell Helix Power Steering is a quality lubricant based on a blend of high viscosity index mineral oils and additives.	Power Steering Systems Recommended for most power steering systems commonly used in light commercial and passenger cars.	Shell Helix Power Steering is suitable for use where the following specifications are called for:  GM                            Fulfils the requirements of the former GM II D.  Allison                        C4

COOLANTS			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Protectacool</b>  Premium anti-freeze, anti-boil and anti-corrosion coolant	Shell Protectacool is an Ethylene Glycol based Engine Coolant using Hybrid Organic Acid anti-corrosion Technology boosted with Nitrite.  A nitrite booster is used to ensure that Cast Iron Liner pitting is eliminated.	Shell Protectacool may be used in all diesel engines. It is also suitable for petrol engines.  Shell Protectacool is a concentrate and should be diluted prior to use with 50% demineralised water for both diesel and gasoline engines (Do not use normal tap water). If concentrate is to be used as a top up, ensure that the final mix in the radiator is equal to a 50% ratio of Shell Protectacool to demineralised water.  Shell Protectacool is miscible and compatible with other coolants (conventional and OAT).  However, it is recommended that the old coolant be flushed from the system to obtain the maximum performance benefits.  Before using any coolant, please ensure that you have consulted your automobile owner's manual and your automobile manufacturer prior to use.	ASTM            ASTM D(3306, 4985, 4656, 5345) AS/NZS        2108.1:1997 Caterpillar    EC1 Cummins       3666132 Detroit Diesel 7SE 298 Chrysler       MS7170 (EUROPE) GM             1825M/1899M John Deere    JDM HD24 MAN            324 (TUC 1637/77) MTU            EVP 1 1827/MTL 5048 and NA  Mercedes Benz MB 325.2, DBL 7700  Porsche       – SAE            J1034/J1941 SAAB Scania   6901 TMC            RP 329 VW             –  Storage Stability Shell Protectacool is stable for at least two years if stored in airtight containers. Do not store the product in galvanized containers.
<b>Shell Protectacool 50</b>  Heavy-duty long life diesel engine Ready-To-Use coolant	Shell Protectacool 50 is a Ready-To-Use Ethylene Glycol based Engine Coolant using Hybrid Organic Acid anti-corrosion Technology boosted with Nitrite.  A nitrite booster is used to ensure that Cast Iron Liner pitting is eliminated.	Shell Protectacool 50 may be used in all diesel engines sold in Australia. It is also suitable for petrol engines.  Shell Protectacool 50 is PRE-diluted to 50% Protectacool and 50% demineralised water.  DO NOT DILUTE ANY FURTHER  Before using any coolant, please ensure that you have consulted your automobile owner's manual and your automobile manufacturer prior to use.	ASTM            ASTM D(3306, 4985,4656, 5345) AS/NZS        2108.1:1997 Catterpillar    EC1 Cummins       3666132 Detroit Diesel 7SE 298 Chrysler       MS7170 (EUROPE) GM             1825M/1899M John Deere    JDM HD24 MAN            324 (TUC 1637/77) MTU            EVP 1 1827/MTL 5048 and NA  Mercedes Benz MB 325.2, DBL 7700 Porsche       – SAE            J1034/J1941 SAAB Scania   6901 TMC            RP 329 VW             –
<b>Shell Coolguard OAT</b>  Premium anti-freeze, anti-boil and anti-corrosion coolant	Shell Coolguard OAT is a glycol based engine coolant with a corrosion inhibitor package that is based on a balanced mixture of organic corrosion inhibitors. It does not contain any amines, borates, nitrites, phosphates or silicates corrosion inhibitor technology and is fully compatible with other similarly formulated engine coolants.  Shell Coolguard OAT is suitable for all passenger cars, 4VVDs, and light, medium and heavy-duty diesel vehicles.	Shell Coolguard OAT is suitable for use in all passenger cars, 4VVDs, light utility vehicles. The product can also be used in diesel passenger cars and also medium and heavy road transport vehicles.  Before using any coolant, please ensure that you have consulted your automobile owner's manual and your automobile manufacturer prior to use.  Shell Coolguard OAT is compatible with Supplemental Coolant Additives (SCA) required by some heavy-duty OEMs.	Shell Coolguard OAT (when pre-diluted under the guidelines described) meets the performance requirements of the following engine coolant specifications:  ASTM            D3306/D4985 Ford            WSS-M97B44-D GM             1825M/1899M/6277M JIS              K 2234 AS/NZS        2108.1:1997 SAE            J1034/J1941 Nissan          NES 5059 LLC Volkswagen   VW/Audi TL 774D US Federal    A-A-870-A

COOLANTS (continued)			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Coolguard OAT Ready-To-Use</b>  AUST ONLY  Premium anti-freeze, anti-boil and anti-corrosion pre-diluted coolant product, Ready-To-Use directly in cooling systems	Shell Coolguard OAT Ready-To-Use is a pre-diluted glycol based engine coolant with a corrosion inhibitor package that is based on a balanced mixture of organic corrosion inhibitors. Shell Coolguard OAT Ready-To-Use is suitable for all passenger cars, 4VVDs, and light duty diesel vehicles.  It is pre-diluted with good quality water and needs no further water addition, ready to use directly in cooling systems.	Shell Coolguard OAT Ready-To-Use is suitable for use in all passenger cars, 4VVDs, and light utility vehicles.  This product is already pre-diluted with water and needs no further water addition. Before using any coolant, please ensure that you have consulted your automobile owner's manual and your automobile manufacturer prior to use.  Shell Coolguard OAT Ready-To-Use does not contain any amines, borates, nitrites, phosphates or silicates corrosion inhibitor technology and is fully compatible with other similarly formulated engine coolants.  Shell Coolguard OAT is compatible with Supplemental Coolant Additives (SCA) required by some heavy-duty OEMs.  Before using any coolant, please ensure that you have consulted your automobile owner's manual and your automobile manufacturer prior to use.	Shell Coolguard OAT Ready-To-Use meets the performance requirements of the following engine coolant specifications:  ASTM            D3306/D4985 Ford            WSS-M97B44-D GM             1825M 1899M 6277M JIS              K 2234 AS/NZS        2108.1:1997 SAE            J1034/J1941 Nissan          NES 5059 LLC Volkswagen   VW/Audi TL 774D US Federal    A-A-870-A
<b>Shell Coolguard HD 50</b>  AUST ONLY  Ready-To-Use heavy-duty diesel engine cooling system protector	Shell Coolguard HD 50 is a fully formulated traditional ethylene glycol based heavy-duty engine coolant concentrate containing borate, nitrite, nitrate, and silicate corrosion inhibitors.	Shell Coolguard HD 50 meets a wide range of OEM and product specifications. It is suitable for both light and heavy-duty applications without supplementary coolant additives during initial fill.  Shell Coolguard HD 50 requires no dilution with water.  Before using any coolant, please ensure that you have consulted your automobile owner's manual and your automobile manufacturer prior to use.	Shell Coolguard HD 50 has been formulated to meet and/or exceed the following coolant specifications:  ASTM            D3306, D4985, D6210  Caterpillar      (other than EC-1) Cummins        Bulletin 3666132 Detroit Diesel   7SE298 DaimlerChrysler MS 7170 Ford             ESE-M97B44A ESE-M97B18-C Freightliner    48-22880 General Motors 1825M, 1899M, Heavy Truck Kenworth       RO26-170-97 Mack Truck New Holland   WSN-M97B18-D PACCAR Peterbilt        8502.002 SAE             J1034, 1941 TMC             RP 329 – Type A Volvo            Heavy Truck US Fed          A-A-870-A

COOLANTS (continued)			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Coolguard PG XL</b>  AUST ONLY	Shell Coolguard PG XL is a propylene glycol, extended life, heavy-duty coolant for use in many applications where traditional coolants are used but where lowered toxicity is desired.  This coolant uses hybrid organic acid chemistry and is phosphate and amine free.  The hybrid organic acid technology (HOAT) allows compatibility with all coolants.  No initial use of SCA's is required.	Shell Coolguard PG XL is suitable for use as a coolant in many automotive and heavy-duty applications following a flush of the prior coolant.  Shell Coolguard PG XL is suitable for industrial and stationary engine applications requiring the use of propylene glycol coolants.	Shell Coolguard PG XL meets performance requirements of a fully formulated coolant. It can be used in the following applications:  ASTM                   D 3306, 4985, 6211  Caterpillar           Cummins Detroit Diesel       Daimler Chrysler Ford HD Trucks     Freightliner GM Heavy Truck     Kenworth Landrover           Mack Trucks MTU                   TMC RP 330 New Holland       PACCAR Peterbilt           Perkins Saab-Scania       Mercedes-Benz MAN                 Volvo Heavy Truck  It is not OEM approved.
<b>Shell Coolguard PG XL 50</b>  AUST ONLY	Shell Coolguard PG XL 50, Pre-Diluted is a propylene glycol, extended life, heavy-duty coolant for use in many applications where traditional coolants are used but where lowered toxicity is desired.  This coolant uses hybrid organic acid chemistry and is phosphate and amine-free. The hybrid organic acid technology (HOAT) allows compatibility with all coolants.  No initial use of SCA's is required.  Since it is pre-diluted, no further dilution is needed for service or initial fill.  To ensure the best services, use the highest quality water available.	Shell Coolguard PG XL 50 is suitable for use as a coolant in many automotive and heavy-duty applications following a flush of the prior coolant.  Shell Coolguard PG XL 50 is suitable for industrial and stationary engine applications requiring the use of propylene glycol coolants.	Shell Coolguard PG XL 50 meets performance requirements of a fully formulated coolant. It can be used in the following applications:  ASTM                   D 3306, 4985, 6211  Caterpillar           Cummins Detroit Diesel       Daimler Chrysler Ford HD Trucks     Freightliner GM Heavy Truck     Kenworth Landrover           Mack Trucks MTU                   TMC RP 330 New Holland       PACCAR Peterbilt           Perkins Saab-Scania       Mercedes-Benz MAN                 Volvo Heavy Truck White Star  It is not OEM approved.

2-STROKE MOTORCYCLE ENGINE OILS			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Advance Racing X2</b>  Ultimate fully synthetic racing 2-stroke engine oil	Shell Advance Racing X2 is a unique, fully synthetic lubricant for ultimate engine protection and performance in 2-stroke racing motorcycle engines and karts with manual gearboxes.  Shell Advance Racing X2 is a race proven technology (Grand Prix, off-road world championships and kart sports) and it is not recommended for day to day on road usage.	World championship competition engines in Grand Prix, motocross, road racing, kart and other 2-stroke motorcycle racing engines. Shell Advance Racing X2 is not ideally suited for "on road use". Advance Ultra 2 or VSX2 are the preferred grades for "on-road" 2-stroke engines.  Shell Advance Racing X2 is non-diluted therefore it is suggested to use it in a premixing system with a mixing ratio of 1:40 unless otherwise recommended by the engine manufacturer.  Shell Advance Racing X2 should not be used in outboard engines.  The appropriate Shell Nautilus Oil is recommended for this application.	Shell Advance Racing X2 is approved by FIM/FIA-CIK.  API Performance   Exceeds TC JASO Performance   Exceeds FC
<b>Shell Advance VSX2</b>  High performance fully synthetic 2-stroke engine oil	Shell Advance VSX2 is a fully synthetic lubricant specifically designed for excellent engine protection and performance in 2-stroke motorcycle engines.  It is formulated to provide superior control against exhaust system blocking and minimizes exhaust smoke.	<ul style="list-style-type: none"><li>• Suitable for all 2-stroke motorcycle engines with oil injection or premix system.</li><li>• Recommended for high-performance air and water-cooled 2-stroke engines.</li></ul> Shell Advance VSX2 should not be used in outboard engines. The appropriate Shell Nautilus Oil is recommended for this application.	Shell Advance VSX2 exceeds the following international specifications:  API TC JASO FD ISO-LEGD  It also exceeds the requirements of all leading motorcycle manufacturers.
<b>Shell Advance SX2</b>  Premium synthetic technology 2-stroke engine oil	Shell Advance SX2 is a premium quality lubricant for 2-stroke motorcycle engines.  It is formulated to provide very good engine protection and cleanliness, reliable control against exhaust system blocking and reduces exhaust smoke.	<ul style="list-style-type: none"><li>• Suitable for all 2-stroke motorcycle engines with oil injection or premix system.</li></ul> Shell Advance SX2 should not be used in outboard engines. The appropriate Shell Nautilus Oil is recommended for this application.	Shell Advance SX2 exceeds the following international specifications:  API TC JASO FB ISO-LEGB  It also meets the requirements of leading motorcycle manufacturers.
<b>Shell Super 2-Stroke</b>  NZ ONLY  General purpose 2-stroke oil	Shell Super 2-Stroke oil is a quality oil specifically blended for all 2-stroke gasoline engines in automotive, industrial and agricultural applications.  It is blended from highly refined mineral base oils and contains carefully selected additives.	Recommended for all 2-stroke gasoline engines in automotive, industrial and agricultural applications.	Performance Specifications  • Meets API TC, JASO FB



4-STROKE MOTORCYCLE ENGINE OILS			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Advance Ultra 4 10W-40</b>  Ultimate performance fully synthetic 4-stroke motorcycle engine oil	Shell Advance Ultra 4 10W-40 is a unique, fully synthetic lubricant for ultimate engine protection and superior clutch and gearbox operation for high performance 4-stroke motorcycles.  The technology has been proven in race and endorsed by leading motorcycle manufacturers.  The product exceeds the requirements of many motorcycle manufacturers.	<ul style="list-style-type: none"><li>High-performance air and water-cooled 4-stroke motorcycle engines, including race-tuned and the ones with gearboxes and wet clutches.</li><li>Motorcycle gearboxes that must be lubricated by engine oils, including some gearboxes in 2-stroke bikes and scooters.</li></ul>	The formulation exceeds the following international specification:  API SG JASO MA  It is also endorsed by Ducati and KTM  Shell Advance Ultra 4 10W-40 exceeds the requirements of all Japanese and European motorcycle manufacturers.
<b>Shell Advance VSX4 15W-50</b>  High performance synthetic based 4-stroke engine oil	Shell Advance VSX4 15W-50 is a synthetic performance lubricant specifically developed for 4-stroke motorcycles, offering excellent engine protection and superior clutch and gearbox operation.  The product exceeds the requirements of all motorcycle manufacturers.	<ul style="list-style-type: none"><li>High-performance air and water-cooled 4-stroke motorcycle engines, including the ones with gearboxes and wet clutches.</li><li>Motorcycle gearboxes that must be lubricated by engine oils, including some gearboxes in 2-stroke bikes and scooters.</li></ul>	The product exceeds the following international specifications:  API SG JASO MA  Shell Advance VSX 4 15W-50 exceeds the requirements of all Japanese and European motorcycle manufacturers.
<b>Shell Advance SX4 15W-50</b>  Premium synthetic fortified 4-stroke engine oil	Shell Advance SX4 15W-50 is a premium quality synthetic fortified engine oil. It provides extra engine performance and protection and meets the 'all-the-year-round' requirements of 4-stroke motorcycle engines.	<ul style="list-style-type: none"><li>All 4-stroke motorcycle engines.</li><li>2-stroke motorcycle gearboxes.</li></ul>	Shell Advance SX4 15W-50 is suitable for use where the following specification is called for:  API SJ JASO MA
<b>Shell Advance S4 20W-50</b>  AUST ONLY  Quality 4-stroke motorcycle oil	Shell Advance S4 20W-50 is a high quality 4-stroke motor cycle oil, manufactured from a careful blend of high viscosity index mineral oils and proven additives to provide a good 'all-year-round' performance in 4-stroke motorcycle engines.	Mineral oil suitable for running in new and rebuilt engines.  Blended to the heavy side of SAE Viscosity 20W-50 to provide additional protection for older engines. <ul style="list-style-type: none"><li>4-stroke motorcycle engines</li><li>2-stroke motorcycle gearboxes</li></ul>	API SG JASO MA
<b>Shell Advance Quad 10W-40</b>  Synthetic fortified 4-stroke engine oil	Shell Advance Quad 10W-40 is a synthetic fortified engine oil specifically formulated for the protection of 3 and 4 wheel all terrain vehicles.	Shell Advance Quad 10W-40 is specially formulated synthetic 4 stroke engine oil all terrain vehicles (ATVs) that are exposed to long period of use in harsh, high temperature conditions with periods of long idle.	API SJ JASO Performance MA
<b>Shell Advance HD 50</b>  AUST ONLY  Heavy-duty 4-stroke engine oil	Shell Advance HD 50 is a synthetic fortified premium engine oil for 4-stroke motorcycles requiring an SAE 50 engine oil, for example Harley-Davidson and Ducati.	Shell Advance HD 50 is not suitable for high performance competition machines. It is also suitable for large capacity single cylinder motorcycles in extreme heat or high performance conditions.  Heavy duty synthetic fortified engine oil for motorcycles requiring an SAE 50 oil.	API Performance SG/CD JASO MA

OTHER MOTORCYCLE ENGINE OILS			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Advance Racing M</b>  High performance SAE 30 racing castor/synthetic engine oil	Shell Advance Racing M is a castor based racing oil with synthetic components. It has been developed especially for 2-stroke karts. It is also recommended for 4-stroke speedway motorcycles and other engines burning alcohol. Shell Advance Racing M is a race proven technology (Kart Sport World Championship).	<ul style="list-style-type: none"><li>2-stroke karts with very high revving 2-stroke racing engines.</li><li>4-stroke speedway motorcycles.</li><li>Racing engines burning alcohol mixture.</li></ul> Shell Advance Racing M is not ideally suited for "on road use". Advance Ultra 2 or VSX 2 are the preferred grades for "on-road" 2-stroke engines.  Shell Advance Racing M is non-diluted therefore it is suggested to use it in premixing system with a mixing ratio of 1:16 for karts and 1:25 for motorcycles unless otherwise recommended by the engine manufacturer.  Shell Advance Racing M should not be used in outboard engines.  The appropriate Shell Nautilus Oil is recommended for this application.	Shell Advance Racing M is approved by FIM/FIA-ClK.  It meets SAE 30 viscosity grade requirements.

MOTORCYCLE SPECIALITIES – GEAR OILS			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Advance Gear 10W-40</b>  Low viscosity semi-synthetic gear oil	Shell Advance Gear 10W-40 is lightweight, semi-synthetic motorcycle gear oil specifically formulated for motorcycle gearboxes.	<ul style="list-style-type: none"><li>• 2-stroke motorcycle gearboxes where an API GL3 product is required.</li><li>• Separate 4-stroke gearboxes where an API GL3 product is required.</li></ul>	The product exceeds: API Service Classification GL3  It meets SAE 10W-40 specification
<b>Shell Advance Shaft</b>  Hypoid gear oil for motorcycle shaft drives	Advance Shaft Drive is hypoid gear oil specially formulated for the lubrication of motorcycle shaft-drive transmissions.	<ul style="list-style-type: none"><li>• Motorcycle shaft-drive transmissions.</li><li>• Motorcycle gearboxes requiring a hypoid gear oil.</li></ul>	API Service Classification GL-5 SAE 80W-90
MOTORCYCLE SPECIALITIES – BRAKE FLUIDS			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Advance Silicone Brake</b>  AUST ONLY  Premium silicone high boiling point motorcycle brake fluid – DOT 5.0	Shell Advance Silicone Brake is a premium silicone type brake fluid, which meets the requirements of AS/NZS 1960.2:1995 Grade 4 and FMVSS 116 DOT 5.	Shell Advance Silicone Brake is suitable for motorcycles and cars requiring a DOT 5 brake fluid. It is a silicone type brake fluid. It is recommended for use in hydraulic disc and drum brake systems requiring a fluid, which meets the above standards.	AS/NZS 1960.2:1995 Grade 4 MIL-B-46176 A – FMVS 116 DOT 5

MOTORCYCLE SPECIALITIES – FORK/SUSPENSION OILS			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Advance Ultra Suspension Fluid</b>  2.5 5  Technically advanced ultra light suspension fluid for competition motorcycles	Shell Advance Ultra Suspension Fluid(s) offer outstanding performance in both competition motorcycle fork and suspension systems. Shell Advance Ultra Suspension Fluid(s) exhibit an extremely high capacity to “stay in grade” even under arduous conditions and high temperatures. Shell Advance Ultra Suspension Fluid(s) are available in 2.5 and 5 grades.  All Shell Advance Fork fluids can be mixed to obtain individual grades for precise tuning.	<ul style="list-style-type: none"><li>• All high performance motorcycle forks.</li><li>• Rear suspension units.</li></ul>	
<b>Shell Advance Fork</b>  5 10 – NZ ONLY 15 20  High stability suspension oil	Shell Advance Fork products are carefully designed to meet the varying viscosity requirements of motorcycle forks, dampers and suspension.	<ul style="list-style-type: none"><li>• All motorcycle forks, including upside down forks.</li><li>• Rear shocks.</li></ul>	The products meet the SAE viscosity grade included in the brand name.
MOTORCYCLE SPECIALITIES – FILTER OILS			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Advance Filter (Non-aerosol)</b>  Air filter protector fluid	Shell Advance Filter (Non-aerosol) is a specially developed oil for pre-treatment of the plastic foam or cotton wadding filters.	All plastic foam or cotton wadding filters.  Apply Shell Advance Filter (Non-aerosol) evenly to the surface of a new or recently cleaned filter and allow to penetrate briefly. Then compress the filter several times to wring out excess fluid.  Next, allow to dry for about 15 minutes in the open air so that the solvent can evaporate and the absorbed filter oil reach its final viscosity. The amount of oil used per treatment should be varied according to the size of the filter.  As a guide, use 7 – 12ml/100 cm3 of filter material.  After saturation with dirt particles, the filter can be easily flushed clean with Shell Advance Brake Cleaner.	
<b>Shell Advance Filter Oil Spray (Aerosol)</b>  AUST ONLY  Air filter protector fluid	Shell Advance Filter Oil Spray (Aerosol) is a specially formulated blend of mineral oil and additives designed to optimize foam filter performance.	Suitable for all oil foam air filters. Shell’s Advance Filter Oil Spray (Aerosol) formulation is designed to ensure that sand, dirt and water are kept out of the engine.  With careful application, Shell Advance Filter Oil Spray (Aerosol) has the right consistency to permeate the entire filter.  Foam filters should be washed in a solvent (such as Kerosene).  Do not use Petrol.	

MOTORCYCLE SPECIALITIES – CHAIN OILS			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Advance Chain Ultra</b>  Premium synthetic chain and cable lubricant	Shell Advance Chain Ultra is a solution/dispersion of synthetic grease and corrosion inhibitors, anti-wear and adhesive additives and non-stick coating powder in aliphatic carbohydrates.  It has been specifically developed to assure the highest lubrication performance of motorcycle chains, both standard and also the one enclosed by O-rings.	<ul style="list-style-type: none"><li>• All chains in the motorcycle sector, both the standard one and the O-rings chains.</li><li>• Other motorcycle lubrication points such as hinges, joints, etc.</li></ul>	
<b>Shell Advance Chain</b>  High quality chain and cable lubricant	High adhesion motorcycle chain lubricant.	Shell Advance Chain is a high quality 'tacky' lubricant for all motorcycle chains and linkages. Recommended for "O" ring type chains.	

MOTORCYCLE SPECIALITIES – BIKE CARE

PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Advance Helmet and Visor</b>  AUST ONLY	Shell Advance Helmet and Visor is a water-based active cleaning foam that dissolves dirt, grime, and grease and removes silicone residues, oil and insects quickly and effectively.	An aerosol applied for motorcycle helmets, visors and plastic surfaces. (Taken from MSDS sheet)  Dissolves dirt, insect residues and grease films.	
<b>Shell Advance Silicone Spray</b>	Shell Advance Silicone Spray is a heat resistant maintenance product that has been created specifically for thermally stressed areas such as engine parts, cylinders, exhaust silencers and crankcases. It can protect metal and plastic parts for longer.  Not only does the silicone spray help restore finish and bring back the paintwork's original color, it also makes the surface water repellent and preserves plastic parts.	Spray onto engine before riding for protection against road grime and mud.  Protects, waterproofs and refreshes metal, plastic and rubber parts.	
<b>Shell Advance Bike Cleaner</b>  AUST ONLY	Shell Advance Bike Cleaner is a quick and simple way to enhance a bike's appearance. It improves the paint finish and gives plastic parts a shinier appearance. It is Shell Advance's dedicated liquid cleaning agent for bikes.	It only takes a gentle cleansing action to remove any dirt and grease whilst increasing paint shine.	
<b>Shell Advance Contact Cleaner</b>  AUST ONLY  Non residue cleaner for motorcycles	Shell Advance Contact Cleaner has been specifically developed for cleaning and degreasing all mechanical parts and systems (carburettors, chain stops, etc), brakes, clutches and electrical point.	Dissolves oil, grease and deposits.  Quick drying and leaves minimal residues.  Easy to apply.	

AIR COMPRESSORS – ROTARY VANE AND SCREW			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Corena Oil AP</b>  68 100  Suitable for reciprocating compressors	Shell Corena Oil AP products are an advanced reciprocating air compressor lubricant and is based on specially selected synthetic ester fluids. It incorporates the latest additive technology to provide the high performance.	<ul style="list-style-type: none"><li>• Reciprocating air compressors – All industrial reciprocating air compressors, in particular up to and above air discharge temperatures of 220°C with continuous high delivery pressures.</li><li>• Breathing air compressors – Shell Corena Oil AP products may be used in breathing air compressors, provided subsidiary clean-up apparatus is used to ensure that the air produced is fit for breathing.</li></ul>	DIN 51506 VDL ISO/DP 6521-L-DAB – medium duty ISO 6743-3:2003 DAB – severe duty EN 12021  <b>Compatibility and Miscibility</b> Seal compatibility  Shell Corena Oil AP products, in common with other ester-based lubricants, is not compatible with all seal materials, and some older compressors may need to have the seals changed before they can be run on the new grades.
<b>Shell Corena Oil AS</b>  46 68 – AUST ONLY  Suitable for rotary-vane and screw type compressors	Shell Corena Oil AS products are an advanced air compressor lubricant, capable of giving high performance in many oil-flooded air compressor of screw or vane design.  Based on selected synthetic base fluids, Shell Corena Oil AS products provide long oil life and effective lubrication in machines working in extremes of temperature and working conditions.	<ul style="list-style-type: none"><li>• Rotary sliding vane and screw air compressors – Oil flooded single and two-stage compressors, in particular those operating with higher output pressures of up to 20 bar and with air discharge temperatures higher than 100°C (including intermittent operation under these conditions).</li><li>• Equipment running under arduous conditions – May also be used where exceptionally high ambient temperatures are found, when the oil temperature cannot be reduced to normal levels.</li><li>• ABB Turbochargers – Recommended for use in ABB turbochargers fitted to low and medium speed diesel engines used in marine and power generation applications.</li></ul>	ISO 6743-3A-DAJ  Shell Corena Oil AS 68 fulfils the requirements of ABB VTR 184.714 "Special low friction synthetic oil" with a maximum oil change interval of 5000 hours (HZTL 90617, list 3).  <b>Miscibility</b> Shell Corena Oil AS products are fully miscible with mineral oils, although dilution with mineral lubricants will markedly reduce its performance. Care must be taken to ensure that Shell Corena Oil AS products are not mixed with other synthetic fluids.  <b>Seal compatibility</b> Shell Corena Oil AS products are compatible with all sealing materials commonly used in air compressors.
<b>Shell Corena Oil P</b>  68 100 150  Suitable for reciprocating compressors	Shell Corena Oil P products are a premium quality reciprocating air compressor lubricant. It is based on a blend of specially selected base oils to provide a level of performance approaching that of synthetic oils.	<ul style="list-style-type: none"><li>• Reciprocating air compressors – Industrial reciprocating air compressors operating with air discharge temperatures of up to 220°C.</li><li>• Breathing air compressors – Shell Corena Oil AP products may be used in breathing air compressors, provided subsidiary clean-up apparatus is used to ensure that the air produced is fit for breathing.</li><li>• Shell Corena P 150 is approved for use in Bauer breathing air compressors.</li></ul>	DIN 51506 VDL ISO 6743-3:2003 DAA Normal Duty  Shell Corena P 150 is approved by Bauer and is included in the "Bauer reference oil list for breathing air compressor lubricants".  <b>Compatibility and Miscibility</b> Seal compatibility  Shell Corena Oil P products are compatible with all sealing materials commonly used in air compressors.
<b>Shell Corena Oil S</b>  46 68 – AUST ONLY  Suitable for rotary-vane and screw type compressors	Shell Corena Oil S products are a premium quality lubricant developed for the lubrication of rotary sliding vane and screw air compressors. It is based on a blend of selected solvent refined base oils and carefully chosen additives.	<ul style="list-style-type: none"><li>• Rotary sliding vane air compressors – Oil flooded or oil injected, single or two-stage compressors, operating at pressures of up to 10 bar and with air discharge temperatures of up to 100°C.</li><li>• Screw air compressors – Oil flooded or oil injected, single or two-stage compressors, operating at pressures of up to 20 bar and with air discharge temperatures of up to 100°C.</li></ul>	ISO 6743-3A-DAH  <b>Compatibility and Miscibility</b> Shell Corena Oil S products are compatible with all sealing materials commonly used in air compressors.

BEARING AND CIRCULATING OILS			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Omala RL</b>  220 460 – AUST ONLY	Shell Omala RL products are a high performance synthetic bearing and circulation lubricant, based on synthesized hydrocarbon fluids.  It offers outstanding lubrication performance under severe operating conditions, including improved energy efficiency and long service life.	Shell Omala RL products are formulated using high viscosity index, solvent refined, base oils and incorporate a special sulphur-phosphorus additive to provide an extreme pressure performance in the following areas: <ul style="list-style-type: none"><li>• Steel gear transmissions.</li><li>• Industrial gear drives where a full EP performance is required.</li><li>• Bearings.</li><li>• Circulating and splash lubricated systems.</li></ul> For automotive hypoid gears, the appropriate Shell Spirax should be used, as Shell Omala RL products are not designed for this purpose.	Meets the ISO 12925-1 Type CKS specification.  <b>Compatibility and Miscibility</b> Shell Omala RL products are compatible with all seal materials and paints normally specified for use with mineral oils.  Recommended for circulation, bath and ring oiled systems subject to severe duty, particularly for high operating temperatures. Suitable for heavily loaded plain or rolling element bearings. Ideal where long service intervals are required, or downtime costs are high.  Shell Omala RL 220 is approved by Alfa Laval Centrifugal Separators used in marine applications.
<b>Shell Vitrea Oil</b>  46 – NZ ONLY 68	Shell Vitrea Oil(s) are premium quality, solvent refined, high viscosity index mineral oils for a wide range of industrial applications.	<ul style="list-style-type: none"><li>• Plain and rolling element bearings.</li><li>• Enclosed spur, helical, bevel and worm gearboxes where a non-additive mineral oil is approved by the gear manufacturer.</li><li>• Machine tool circulatory systems.</li><li>• Shell Vitrea Oil(s) may be used in industrial applications where loadings and temperatures are moderate.</li></ul>	C according to DIN 51517-1 VB/VC according to DIN 51506  <b>Compatibility and Miscibility</b> Shell Vitrea Oil(s) are compatible with all seal materials and paints normally specified for use with mineral oils.
<b>Shell Vitrea Oil 22</b>  NZ ONLY Mineral process oil applications	Shell Vitrea Oil 22 is a neat mineral oil and may be used as a general purpose paraffinic process oil in a variety of manufacturing applications as extender or carrier fluid.  It is manufactured via the solvent extraction process.	<ul style="list-style-type: none"><li>• Plain and rolling element bearings.</li><li>• Enclosed spur, helical, bevel and worm gearboxes where a non-additive mineral oil is approved by the gear manufacturer.</li><li>• Machine tool circulatory systems.</li><li>• Shell Vitrea Oil 22 may be used in industrial applications where loadings and temperatures are moderate.</li></ul>	C according to DIN 51517-1 VB/VC according to DIN 51506  <b>Seal and Paint Compatibility</b> Shell Vitrea Oil 22 is compatible with all seal materials and paints normally specified for use with mineral oils.
<b>Shell Vitrea Oil M 680</b>  Premium industrial bearing and circulating oil	Shell Vitrea Oil M is blended from solvent refined, paraffinic mineral oils for the lubrication of heavy-duty industrial bearings and circulating systems.	For use in the following applications where temperatures and loadings are moderate: <ul style="list-style-type: none"><li>• Roll-neck bearings.</li><li>• Circulating systems.</li><li>• Plain and rolling element bearings.</li><li>• Enclosed spur, helical, bevel and worm gearboxes where the use of a non-additive is approved by the equipment manufacturer.</li></ul>	Shell Vitrea Oil M 680 meets the requirements of the following specifications:  Morgan Construction Company  Morgoil roll neck bearings

BEARING AND CIRCULATING OILS (continued)			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Delima 150</b>  AUST ONLY  Dryer bearing oil circulation systems for paper machines	Shell Delima 150 is a premium quality mineral oils for use in lubrication systems in paper machines.	<ul style="list-style-type: none"><li>• Lubrication of bearings in the (drying) section of paper machines.</li><li>• Hydraulic and lubrication systems in deflection-compensating rolls.</li><li>• Enclosed gears not requiring full EP performance.</li></ul>	Shell Delima 150 can be used when DIN 51517. Pt.2 type oils are required. FZG: DIN 51354 stage 12 Pass.  <b>Compatibility and Miscibility</b> Shell Delima 150 is compatible with seal materials and paints specified for use with mineral oils.
<b>Shell Delima S</b>  150 – AUST ONLY 220 – AUST ONLY  Premium quality dryer bearing oil circulation systems for paper machines	Shell Delima S products are premium quality mineral oils for use in lubrication systems in modern paper machines.  Formulated by Zinc free technology.	Shell Delima S 150 is recommended for use in the following applications: <ul style="list-style-type: none"><li>• Circulating lubrication systems of paper machines.</li><li>• Hydraulic and lubrication systems in deflection-compensating rolls.</li><li>• Enclosed gears not requiring full EP performance.</li></ul>	Shell Delima S products can be used when DIN 51517 Pt.2 type oils are required. FZG: DIN 51354 stage 12 Pass.  <b>Compatibility and Miscibility</b> Shell Delima S products are compatible with seal materials and paints specified for use with mineral oils.
<b>Shell Morlina Oil</b>  10 150 220 320 460 – NZ ONLY	Shell Morlina Oil(s) are high viscosity-index, solvent refined mineral oils blended with zinc free anti-wear and other additives to provide extended performance in circulatory systems or certain hydraulic systems.	<ul style="list-style-type: none"><li>• Machine circulation systems.</li><li>• Oil lubricated plain and rolling element bearings.</li><li>• High speed spindles (ISO grades 5 and 10 only).</li><li>• Certain low loaded enclosed gears.</li><li>• Some industrial hydraulic transmission and control systems containing steel-on-bronze and silver lubrication surfaces.</li></ul>	<b>Compatibility and Miscibility</b> Shell Morlina Oil(s) are compatible with all normal mineral oil seal materials. This includes Nitrile and Butyl rubbers, Neoprene, Viton etc., where minimal swell and hardening are required in service.



ELECTRICAL OILS			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
Shell Diala Oil B	Shell Diala Oil B is a non-inhibited insulating oil manufactured from naphthenic feedstocks.  It offers good dielectric properties, good oxidation stability and provides efficient heat transfer.  It has excellent low temperature properties achieved without the use of pour point depressants.	<ul style="list-style-type: none"><li>Transformers. Electrical insulating oil for grid and industrial transformers.</li><li>Electrical equipment. Components like rectifiers, circuit breakers, switch-gears.</li></ul>	IEC 60296 (2003), Table 2 Transformer Oil (U), uninhibited  Shell Diala Oil B has been shown to pass the following newly emerging test procedures for copper corrosion:  ASTM D 1275B proposed CIGRE CCD test.
Shell Diala Oil BX	Shell Diala Oil BX is an inhibited insulating oil manufactured from naphthenic feedstocks.  It offers good dielectric properties, good oxidation stability and provides efficient heat transfer.  It has excellent low temperature properties achieved without the use of pour point depressants.	<ul style="list-style-type: none"><li>Transformers. Electrical insulating oil for grid and industrial transformers.</li><li>Electrical equipment. Components such as rectifiers, circuit breakers and switchgear.</li></ul>	Shell Diala Oil BX meets the following specifications: IEC 60296 (2003), Table 2 Transformer Oil (I), inhibited  Shell Diala Oil BX has been shown to pass the following newly emerging test procedures for copper corrosion:  ASTM D 1275B proposed CIGRE CCD test.
ELECTRICAL OILS – OTHERS			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
Shell Diala Concentrate P  Passivator concentrate	Shell Diala Concentrate P is a concentrated copper passivator to reduce the risk of conductive deposit formation in insulating systems with mineral oil based electrical oil.  It is a concentrate of 10% passivator dissolved in oil meeting the IEC 60296 general specification for transformer oil.	Passivation of mineral oil based electrical oils used in: <ul style="list-style-type: none"><li>Industrial transformers Electrical insulating oil for grid and industrial transformers</li><li>Electrical equipment Components such as rectifiers, circuit breakers and switchgear.</li></ul>	The oil in which the passivator is dissolved to make Shell Diala Concentrate P meets:  IEC 60296 (2003).  Table 2 Transformer Oil (Uninhibited).

GAS ENGINE OILS			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
Shell Mysella R 40  AUST ONLY	Shell Mysella R 40 is a highly refined mineral oil fortified with additives specially chosen for low ash characteristics.  They are designed for use in spark-ignition gas engines, which require a very low-ash crankcase oil.	<ul style="list-style-type: none"><li>Spark-ignition gas engines where a very low ash oil is specified.</li><li>Lower rated gas engines of older design.</li><li>Suitable for both two and 4-stroke engines.</li></ul> Shell Mysella R 40 is designed for use with natural gas and other hydrocarbon gases which are essentially free from sulphur and halogenated compounds.	Meet the performance requirements of: DEF STAN 91-31/1 API Classification CB MWM Deutz (Group D)
Shell Mysella LA 40	Shell Mysella LA 40 is a premium quality oil blended for use in highly-rated, spark-ignition engines which require a 'low ash' oil.  It satisfies the new generation of stationary gas engines designed to meet the emerging legislation limiting emissions of NOx, and those which employ the latest 'lean' or 'clean' burn technology.	Spark-ignited gas engines fuelled by natural gas – Although Shell Mysella LA 40 is mainly developed to be used in natural gas applications it can also be used in engines fuelled by sour gases when a 'low ash' oil is required.	Recommendations: API CD Caterpillar Meets the requirements for stationary gas engines  Shell Mysella LA 40 is approved by: Cummins MWM Deutz Jenbacher (with 3-way catalyst) MTU Ruston Diesels Wärtsilä Perkins  Shell Mysella LA 40 is also suitable for a number of other engine types, where a 'low ash' oil is required.
Shell Mysella MA 40	Shell Mysella MA 40 is a premium quality oil blended for use in highly-rated spark ignition and dual-fuel 4-stroke engines which require a 'medium ash' oil, or where "sour gas" is in use.  It satisfies the new generation of stationary gas engines designed to meet the emerging legislation limiting emissions of NOx, and those which employ the latest 'lean' or 'clean' burn technology.	<ul style="list-style-type: none"><li>Spark-ignition gas engines where a very low ash oil is specified.</li><li>Lower rated gas engines of older design.</li><li>Suitable for both two and 4-stroke engines.</li></ul> Shell Mysella MA 40 is designed for use with natural gas and other hydrocarbon gases, which are essentially free from sulphur and halogenated compounds.	API CD  Shell Mysella MA 40 is approved by: Dorman Jenbacher (except 3-way catalyst, see Mysella LA) M.D.E. (natural gas/propane) Ruston Diesels Waukesha (including cogeneration application)
Shell Mysella XL 40  AUST ONLY  Long life stationary gas engine oil	Shell Mysella XL 40 is a high performance quality oil blended for use in highly-rated, 4-stroke, spark-ignition engines which require a 'low ash' oil.  Shell Mysella XL 40satisfies the new generation of stationary gas engines designed to meet the emerging legislation limiting emissions of NOx, and those which employ the latest 'lean' or 'clean' burn technology.  Shell Mysella XL 40 is specially developed to provide extended drain intervals in those natural gas engines where oil life is a limiting operational factor.	<ul style="list-style-type: none"><li>Spark-ignited gas engines fuelled by natural gas, especially those creating high oil stress.</li><li>May also be used for landfill and biogases.</li></ul>	Shell Mysella XL 40 is suitable in engine types where a "low ash" oil is required. It meets the requirements of Caterpillar and Waukesha and is approved by MWM Deutz, Wärtsilä, Rolls Royce (Ulstein Bergen), MAN, MDE and by Waukesha for high temperature cogen applications.  API performance level CF

HEAT TRANSFER OILS			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
Shell Thermia Oil B	Shell Thermia Oil B is based on carefully selected highly refined mineral oils chosen for their ability to provide superior performance in indirect closed fluid heat transfer systems.	Enclosed circulated heat transfer systems for industrial applications such as process industry, chemical plants, textile producers etc and in household equipment such as oil filled radiators.  Shell Thermia Oil B can be used in high temperature continuous heat transfer equipment with the following application limits:  Max film temperature – 340°C Max bulk temperature – 320°C	Classified as ISO 6743-12 Family Q  Meets typically DIN 51522 requirements
Shell Thermia Oil D	Shell Thermia Oil D is a higher viscosity heat transfer fluid for use in indirectly heated closed heat transfer systems. It is based on carefully selected highly refined mineral oils chosen for their ability to provide superior performance in heat transfer systems.	Industrial heat-transfer systems. For use in closed heat transfer systems used in chemical and process plant, textile manufacture etc, where the oil is circulated in a pumped system operating under atmospheric pressure with or without an inert gas blanket.  Shell Thermia Oil D can be used in high temperature continuous heat transfer equipment with the following application limits:  Max film temperature – 340°C Max bulk temperature – 320°C	Classified under ISO 6743-12 Family Q  Meets DIN 51522 requirements

HYDRAULIC SYSTEMS			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
Shell Tellus Oil  22 32 46 68 100	Shell Tellus Oil(s) are premium quality, solvent refined, high viscosity index mineral oil based fluids generally acknowledged to be the ‘standard-setter’ in the field of industrial hydraulic and fluid power lubrication.	<ul style="list-style-type: none"><li>Industrial hydraulic systems.</li><li>Mobile hydraulic fluid power transmission systems.</li><li>Marine hydraulic systems.</li></ul> Can be used for most hydraulic requirements in equipment such as machine tools, forklift trucks hydraulic presses and rams, earthmoving equipment etc. Shell Tellus Oil(s) are not suitable for equipment with silver bearing surfaces for which Shell Tellus Oil S should be used.	Tellus Oils have the following approvals: CINCINNATI P-68 (ISO 32) CINCINNATI P-70 (ISO 46) CINCINNATI P-69 (ISO 68) DENISON HF-0 DENISON HF-1 DENISON HF-2 Eaton (Vickers) M-2950 S Eaton (Vickers) I-286 S  Tellus Oils meet the requirements of: ISO 11158 GM LS/2 AFNOR NF-E 48-603 Bosch Rexroth Ref 17421-001 and RD 220-1/04.03 Swedish Standard SS 15 54 34 AM  <b>Compatibility</b> Shell Tellus Oil(s) are compatible with most pumps. However, please consult your Shell representative before using in pumps containing silver plated components.  <b>Seal and Paint Compatibility</b> Shell Tellus Oil(s) are compatible with all seal materials and paints normally specified for use with mineral oils.
Shell Tellus Oil S  32 – AUST ONLY 46 68 100 – AUST ONLY	Shell Tellus Oil S products are ‘top-tier’, anti-wear hydraulic oils formulated to be the ultimate ‘high reference oil’ in the hydraulics industry.  Based on advanced ‘zinc and chlorine free’ technology, Shell Tellus Oil S products are formulated to ensure exceptional performance in hydraulic fluid power transmission systems subjected to severe duty.	Primary application in industrial, marine and mobile hydraulic and fluid power transmission systems.	Shell Tellus S have been tested and approved to exceed the following industry requirements:Denison HF-0 Rexroth Vickers M-2950-S (Mobile systems) I -286-S (Industrial systems) Cincinnati Milacron P68, P69, P70

HYDRAULIC SYSTEMS (continued)			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Tellus T</b> 15 37 46 68 100	Premium performance, anti-wear hydraulic oils which incorporate a special viscosity index improver additive to enhance their viscosity/temperature characteristics.	<p>Hydraulic and fluid power transmission systems subjected to wide variations in temperature or where low viscosity change with fluctuating temperature is required.</p> <p>Certain critical hydraulic systems can only tolerate small variations in viscosity with fluctuating temperature if efficiency and responsiveness are to be maintained. Hydraulic oils, such as Shell Tellus T, which exhibit multigrade viscosity characteristics may be used to particular advantage in these circumstances.</p>	<p><b>Compatibility</b> The anti-wear additive technology used in Shell Tellus T is based upon zinc which, although ideal for most hydraulic pumps, should not be used in those of older design containing silver-plated components. Shell Tellus S should be used for these applications.</p> <p><b>Seal and Point Compatibility</b> Shell Tellus T are compatible with all seal materials and paints normally specified for use with mineral oils.</p>
<b>Shell Tellus Arctic 32</b> NZ ONLY Hydraulic fluid for extremely low temperatures	Shell Tellus Arctic 32 is a zinc-free hydraulic fluid designed especially for use in outdoor equipments, like the mining and forestry machinery, operating at very low temperatures.	<ul style="list-style-type: none"><li>• Tellus Arctic 32 has been designed for use in all types of hydraulic systems where the operating temperature does not continuously exceed 75°C.</li><li>• The major application of Shell Tellus Arctic 32 is in systems that must be started up at extremely low temperatures with a subsequent temperature increase during operation.</li><li>• Mining and Forestry machinery is a typical example.</li></ul> <p>In order to evaluate more exactly the operating temperature range the hydraulic systems manufacturer has to be consulted to obtain indication on the maximum and minimum kinematic viscosities admitted.</p>	<p><b>Compatibility and Miscibility</b> Shell Tellus Arctic 32 is compatible with most pumps and with all seal materials and paints normally specified for use with mineral oils.</p>

HYDRAULIC FLUIDS – FIRE RESISTANT			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Naturelle HF-E 46</b>	<p>Shell Naturelle HF-E 46 is an advanced biodegradable hydraulic fluid for use in power transmission and hydraulic systems working in environmentally sensitive areas.</p> <p>Synthetic esters blended with specially tailored additive systems provide Shell Naturelle HF-E 46 with a superior balance of biodegradability, lubrication performance and compatibility with the environment.</p>	<ul style="list-style-type: none"><li>• Heavy-duty hydraulic systems for construction and earth moving equipment.</li><li>• Machine tool hydraulic systems.</li><li>• Hydrostatic drive gears.</li><li>• General industrial control equipment and hydraulic systems.</li><li>• Moderately rated gearboxes where an anti-wear hydraulic oil is specified.</li></ul>	<p>Shell Naturelle HF-E 46 can be used where DIN 51524 Part 2 or Part 3 (HLP/HVLP) anti-wear petroleum mineral hydraulic oil is specified. Bulk fluid operating temperatures should not be allowed to exceed 90°C and optimum fluid life will be realised if operating temperatures are maintained at approximately 55°C.</p> <p><b>Compatibility with Mineral Oils</b> Shell Naturelle HF-E 46 is miscible with conventional mineral oil based hydraulic oils in all proportions. However, in order to ensure that biodegradability properties are maintained, the system should be drained and flushed prior to change over. Owing to the surface wetting properties of Shell Naturelle HF-E 46, if systems were previously operated using petroleum-based hydraulic oils, deposits formed in the system during operation may be loosened and deposited in system filters. The hydraulic filters should, therefore, initially be checked at regular intervals.</p> <p><b>Seal and Paint Compatibility</b> Shell Naturelle HF-E 46 is compatible with all seal materials and paints normally specified for use with petroleum mineral oils. Certain plastics and industrial adhesives may be adversely affected and advice should be sought from the respective manufacturers.</p>
<b>Shell Irus DU 46</b> NZ ONLY High performance less flammable hydraulic fluid	Shell Irus DU 46 is an advanced, synthetic, anhydrous less flammable hydraulic fluid based on organic esters and proven additives. This ISO Class HFDU fluid is specially designed to provide good performance in conventional hydraulic systems and has better fire resistance than mineral oils.	Typical applications for Shell Irus Fluid DU 46 are to be found in the metal, mining and glass industries. Shell Irus Fluid DU 46 can be used to replace mineral oils in hydraulic installations as it provides good lubrication and a higher degree of fire resistance.	<p>Shell Irus DU 46 meets the requirements of: ISO Classification L-HF DU according to ISO 6743/4</p> <p>The European Communities Mines Safety Commission 7th Report – Requirements for less flammable fluids</p> <p>FMR (Factory Mutual Research) Corporation (under review)</p>

HYDRAULIC FLUIDS – BIODEGRADABLE			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Irus Fluid DR</b> 46 – AUST ONLY	Shell Irus Fluid DR is a tri-aryl phosphate ester fire-resistant hydraulic fluid and contains carefully selected additives to give superior oxidation and hydrolytic stability characteristics.	Hydraulic and power transmission systems used in the steel and mining industries and other applications which call for a fire-resistant hydraulic fluid. <ul style="list-style-type: none"><li>• Die-casting Machines</li><li>• Billet Loaders</li><li>• Electric Arc Furnaces</li><li>• Forging Presses</li><li>• Welding Robots</li><li>• Continuous Casting Machines</li><li>• Hydraulic Presses</li><li>• Extrusion Presses</li></ul>	<b>Compatibility and Miscibility</b>  Seal Compatibility  Butyl, Viton, *Ethylene/Propylene (*Contact seal suppliers for advice)  Paints – Epoxy resin paints are compatible  Metals – Satisfactory with common constructional metals. Aluminium and its alloys should be hard anodized and not used as bearing surfaces
<b>Shell Irus Fluid C</b>	Shell Irus Fluid C is an advanced water-glycol fire resistant hydraulic fluid containing powerful additives to enhance its anti-wear, anti-corrosion and anti-oxidation properties.  The water content is approximately 40% by weight.	Shell Irus Fluid C is particularly suitable for demanding hydraulic applications where there is a high fire risk, such as those found in the Mining and Metal Processing industries.	Shell Irus Fluid C is tested and approved by the UK Health and Safety Laboratory (Buxton) for fire resistance according to European legislative requirements.  Resistance to flame (UK) test – Lux 7th 3.1.2  Stabilised flame heat release test – Lux 7th 3.1.3  Wick test – Lux 7th 3.2.2  Irus C is compliant with the essential technological test criteria of the “Safety and Health Commission for the Mining and Other Extractive Industry 7th Edition 4746/10/91” also known as “7th report of Luxembourg”.  Irus C meets also the following requirements: ISO 6743-4 (1999) HFC Type Fluid ISO 12922 (1999) HFC Type Fluid

GEAR SYSTEMS			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Omala Oil</b>  68 100 150 220 320 460 680 800	Shell Omala Oil(s) are high quality, lead-free, extreme-pressure oils designed, primarily, for the lubrication of heavy-duty industrial gears.  Their high load carrying capacity and anti-friction characteristics combine to offer superior performance in gears and other industrial applications.	Shell Omala Oil(s) are formulated using high viscosity index, solvent refined, base oils and incorporates a special sulphur-phosphorus additive to provide an extreme pressure performance in the following areas: <ul style="list-style-type: none"><li>• Steel gear transmissions.</li><li>• Industrial gear drives where a full EP performance is required.</li><li>• Bearings.</li><li>• Circulating and splash lubricated systems.</li></ul> For automotive hypoid gears, the appropriate Shell Spirax should be used, as Shell Omala Oil(s) are not designed for this purpose.	Meets the ISO 12925-1 Type CKC specification.  Meets the David Brown S1.53.101 specification.
<b>Shell Omala Oil HD</b>  150 – AUST ONLY 220 320 460	Shell Omala Oil HD products are an advanced synthetic heavy-duty industrial gear oil offering outstanding lubrication performance under severe operating conditions, including energy efficiency, long service life and high resistance to micro-pitting for optimal gear protection.	Enclosed industrial reduction gear systems operating under severe operating conditions, such as high load, very low or elevated temperatures and wide temperature variations <ul style="list-style-type: none"><li>• Particularly recommended for certain ‘lubricated-for-life’ systems.</li><li>• Plain and rolling element bearings.</li><li>• Oil circulation systems.</li></ul>	Meets the ISO 12925-1 Type CKD specification.  Meets the ANSI/AGMA 9005-D94 specification.  Meets the US Steel 224 specification.  Fulfill the requirements of and is approved by Flender AG.  Meets the David Brown S1.53.101 specification.  <b>Seal and paint compatibility</b> Shell Omala Oil HD products are compatible with all seal materials and paints normally specified for use with mineral oils.
<b>Shell Omala Oil F</b>  320 – AUST ONLY 460	Shell Omala Oil F products are a premium quality, lead-free, extreme-pressure oil designed, primarily, for the lubrication of heavy-duty industrial gears.  Their high load carrying capacity and anti-friction characteristics combine to offer superior performance in gears and other industrial applications.  They are formulated using high viscosity index, solvent refined, base oils and incorporate a special sulphur-phosphorus additive to provide an extreme pressure performance significantly better than that provided by leaded gear oils. Shell Omala Oil F products are formally approved by Flender AG.	<ul style="list-style-type: none"><li>• Steel gear transmissions.</li><li>• Industrial gear drives where a full EP performance is required.</li><li>• Bearings.</li><li>• Circulating and splash lubricated systems.</li></ul> Shell Omala Oil F products should not be used for automotive hypoid gears. The appropriate Shell Spirax should be used for this purpose.	Shell Omala Oil F products are approved against Flender AG’s requirements of 22/1/96 which include:  Sufficient oxidation stability for a lifetime of 10,000 hours or two years at 80°C.  Load stage 12 pass in the FZG double speed test (DIN 51354 Part 2).  Pass in the FVA-54/II micro pitting (grey staining) test at load stage 10 at 90°C.  Plus: <ul style="list-style-type: none"><li>• Compatibility with internal gearbox paints.</li><li>• Compatibility with solid seals.</li><li>• Compatibility with liquid seals.</li><li>• Flender Foam Test.</li></ul>



GEAR SYSTEMS (continued)			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Omala Oil JM</b>  460 – AUST ONLY	<p>Shell Omala Oil JM is specially formulated using high quality base stocks, a shear stable dispersant type viscosity index improver and a premium sulfur-phosphorous additive package, which provides both extreme pressure and anti-wear properties.</p> <p>The dispersant can help the oil tolerate up to 40% water and work with the additives to pass stage 13 in the FZG test. Furthermore, the additive package is non-corrosive to gear and bearing materials such as steel, copper, bronze, brass, babbitt or cadmium-nickel.</p> <p>Whereas most gear oils are formulated to separate water, Shell Omala Oil JM will not separate from water even after 48 hours in the ASTM D1401 demulsibility test.</p>	<p>In some applications, gear oils are exposed to high levels of water contamination and it is not possible to dry the oil while it is in service. The presence of free water can lead to rapid gear wear due to lack of lubrication; it can also promote rust formation.</p> <p>Shell Omala Oil JM helps reduce the adverse effects of water by forming a stable emulsion with the free water and providing a continuous oil film on the heavily loaded parts. It is recommended for use in the following applications:</p> <ul style="list-style-type: none"><li>• Any gear oil application where an ISO 460 viscosity grade is appropriate.</li><li>• Any gearset that is operating under heavy shock load conditions and especially one where high levels of water contamination are present and cannot be controlled or removed from the gearboxes in any other way.</li><li>• Especially useful in the cutter head gears and crawler drives of continuous mining machines.</li><li>• Spur, bevel, herringbone and worm gear designs in mill, mining and mobile equipment applications calling for ANSI/AGMA Lubricant No. 7 EP.</li><li>• Where U.S. Steel No. 224 lubricants are specified.</li></ul>	<p>JOY TECHNOLOGIES (TO-HD) Approved</p>
<b>Shell Naturelle Gear Oil EP 32</b>  AUST ONLY	<p>Shell Naturelle Gear Oil EP 32 is an advanced synthetic bio-degradable gear and bearing oil offering outstanding lubrication performance under severe duty conditions, including energy efficiency, long service life and high resistance to micro-pitting for optimal gear protection.</p>	<ul style="list-style-type: none"><li>• Mobile equipment where there is a risk that the lubricant can leak into the environment, in particular, gear and lubrication systems of off-highway equipment, railway rolling stock and trackside equipment, ferries, etc.</li><li>• Enclosed industrial reduction gear systems subjected to severe operating conditions, such as high load, low or elevated temperatures and wide temperature variations.</li><li>• Plain and rolling element bearings.</li><li>• Oil circulation systems.</li></ul>	<p>Fulfills the requirements of and is approved by Flender AG.</p> <p>Meets the requirements of Biodegradability Specification OECD 301B.</p> <p><b>Seal and Paint Compatibility</b> Shell Naturelle Gear EP 32 is compatible with all seal materials and paints normally specified for use with mineral oils.</p>

WARM DRIVE GEARBOXES			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Tivela Oil S</b>  150 220 320	<p>Shell Tivela Oil S products are an advanced synthetic heavy-duty industrial gear oil formulated using specially selected polyalkylene glycol base fluids and additives. It offers outstanding lubrication performance under severe operating conditions, including improved energy efficiency, long service life and high resistance to micro-pitting.</p>	<ul style="list-style-type: none"><li>• Enclosed industrial reduction gear systems operating under severe operating conditions, such as high load, very low or elevated temperatures and wide temperature variations.</li><li>• Worm gears.</li><li>• Particularly recommended for certain 'lubricated-for-life' systems.</li><li>• Bearing and circulation systems such as calendars, where high bulk oil temperatures are found.</li><li>• Plain and rolling element bearings.</li></ul> <p>Shell Tivela Oil S products are not recommended for the lubrication of worm gears manufactured from aluminium containing bronze alloys.</p>	<p>Meet the David Brown Type G specification. Fully approved by Flender AG.</p> <p><b>Compatibility and Miscibility</b> High quality epoxy paints are recommended, as polyalkylene glycols will tend to attack certain conventional paints. Shell Tivela Oil S products have been found to be satisfactory with nitrile and Viton seal materials, although Viton seals are preferred.</p>
<b>Shell Tivela GL 00</b>	<p>Shell Tivela GL 00 is a synthetic, semi-fluid gear lubricant developed to meet the highest requirements of industrial gearboxes allowing long life operation.</p>	<ul style="list-style-type: none"><li>• Small industrial gear units.</li><li>• Worm gears – the low steel/tin-bronze frictional characteristics of Shell Tivela GL 00 make it particularly suitable for worm gears having this combination of alloys.</li><li>• Paints – High quality red lead or epoxy resin paints are recommended for use in contact with Shell Tivela GL 00, as the synthetic polyglycol component will tend to attack certain conventional paints.</li><li>• Seals – Shell Tivela GL 00 may be used satisfactorily with all normal seal materials. Leather seals are not recommended as the natural fats tend to be removed leaving the seals thin and brittle.</li></ul>	<p>NLGI 00</p>

POWER GENERATION ENGINE OILS			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Argina T</b> 30 40	Shell Argina T products are a multifunctional crankcase lubricant for highly rated medium-speed diesel engines operating on residual fuel. Shell Argina T products are designed for conditions of moderate oil stress.	Medium-speed industrial or marine propulsion and auxiliary engines, burning residual fuel oils, which create conditions of moderate oil stress. These conditions usually occur: <ul style="list-style-type: none"><li>• In engine designs more than 5 years old, or</li><li>• Where oil consumption is 1g/kWh or more, or</li><li>• In newer designs where load factors are predominantly 85% or less, or</li><li>• Where fuels with sulphur &lt;3% are in use,</li><li>• Marine engine reduction gears and certain other ship-board applications, where specialist lubricants are not required.</li><li>• Medium-speed engines burning residual fuel need very specialised lubricants.</li></ul>	Shell Argina T products enjoy a comprehensive range of Original Equipment Manufacturers' approvals through field experience over many years and meets the engine test criteria for API CF.
<b>Shell Gadinia</b> 30 40	Shell Gadinia products are premium quality multifunctional diesel engine lubricants that are specially designed for the most severe service main propulsion and auxiliary marine trunk piston engines burning distillate fuels with a sulphur content up to 1%. They also perform satisfactorily in smaller high-speed engines of fishing fleets that operate under arduous conditions and have small sumps.	Highly rated, medium speed, main propulsion and auxiliary trunk-piston marine diesel engines. <ul style="list-style-type: none"><li>• Geared transmissions, turbochargers, oil filled stern tubes and variable pitchpropellers.</li><li>• Deck machinery and other marine applications requiring SAE 30 or 40 viscosity oils.</li></ul>	API CF  Shell Gadinia is approved by leading trunk piston-engine manufacturers  FZG Gear Rig Test 11th load stage
RAILWAY ENGINE OILS			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Caprinus XR</b> 40 20W-40	Shell Caprinus XR products are a premium grade, heavy-duty, engine oils, intended mainly for railroad diesel engines of North American origin, particularly those manufactured by General Electric and General Motors Electro-Motive Division (EMD).  Shell Caprinus XR products use the latest, low-chlorine additive technology, which offers both environmental benefits and improved performance. Shell Caprinus XR products do not contain zinc and are approved for use by GM-EMD for their engines fitted with silver piston-pin bearings and by GE for their latest locomotives.  The performance of Shell Caprinus XR products has been demonstrated in highly rated North American railroad operation subject to the most severe operating conditions.	<ul style="list-style-type: none"><li>• North American diesel engines subjected to the most arduous duty where 'zinc-free' oils are recommended by the engine manufacturer. Applications are primarily for railroad locomotives, however, Shell Caprinus XR products may also be suitable for certain engines in power generation, marine and mine-haul applications.</li><li>• Shell Caprinus XR products are low chlorine formulations meeting the requirements of leading railroad operators in North America.</li></ul>	API Classification    CF  EMD                      Approved "Worthy of full scale field test" (WOFT)  General Electric      Gen 4 – Long Life "tentative approval"  LMOA                    Generation 5  Detroit Diesel        Recommended for DDC Series 149 engines under severe conditions

REFRIGERATOR OILS			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Clavus Oil</b> 15 – AUST ONLY 46 68	Shell Clavus Oil(s) are high quality, hydrotreated naphthenic mineral oils without additives. Specific selection of the base oil gives a range of products specially suited for the efficient lubrication of refrigerator compressors.	<ul style="list-style-type: none"><li>• Refrigerator compressors. Shell Clavus Oil(s) are designed for the lubrication of compressors with ammonia (R717) as refrigerant. It can also be used when hydrocarbons (e.g. R600a) are the refrigerant. It may be used with halogenated hydrocarbon (R12, R22) if Shell Clavus Oil G is not available. For all refrigeration and air-conditioning applications: domestic, commercial and industrial systems with high, moderate or low evaporation temperatures.</li><li>• General lubrication Apart from the application in refrigerators Shell Clavus can also be used for general lubrication at low temperatures.</li></ul>	Shell Clavus Oil(s) meet the requirements of DIN 51503 KAA, KC and KE.
<b>Shell Clavus Oil G</b> 32 – NZ ONLY 68 46 – NZ ONLY	Shell Clavus Oil G products are high quality, hydrotreated naphthenic mineral oils without additives. Specific selection of the base oils and advanced refining techniques give a range of products specially suited for the efficient lubrication of refrigeration compressors.	<ul style="list-style-type: none"><li>• Refrigerator compressors – Shell Clavus Oil G products are designed for the lubrication of compressors using halogenated hydrocarbons as the refrigerant (R12, R22). It is also suitable for use with hydrocarbon refrigerants (e.g. R600a). For all refrigeration and air-conditioning applications: domestic, commercial and industrial systems with high, moderate or low evaporation temperatures.</li><li>• Ammonia as refrigerant – Shell Clavus Oil G products should not be used in ammonia systems with low evaporation temperatures when it cannot be guaranteed that the refrigerant system is airtight.</li></ul>	Shell Clavus Oil G products meet the requirements of DIN 51503 KC, KAA and KE.
<b>Shell Clavus Oil SP 68</b>	Shell Clavus Oil SP 68 is a synthetic lubricants based on polyalphaolefines (PAOs). They are particularly recommended for refrigerator compressors operating with ammonia (R717) as refrigerant.	<ul style="list-style-type: none"><li>• Refrigerator compressors – Shell Clavus Oil SP 68 is recommended for use in open, semi-open and hermetic compressors in domestic, commercial and industrial refrigeration systems. It can be used in both screw and reciprocating compressor types.</li><li>• Shell Clavus Oil SP 68 is designed for application with ammonia (R717) where it offers an excellent performance, even under high temperatures or below -33°C evaporation temperature.</li><li>• Other refrigerants than ammonia – Shell Clavus Oil SP 68 is also fully suitable for use with halogenated refrigerants (CFC, HCFC).</li></ul>	Shell Clavus Oil SP 68 meets the requirements of DIN 51503, KAA and KC.

REFRIGERATOR OILS (continued)			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Clavus SD 22-12 32</b>  AUST ONLY	Shell Clavus SD 22-12 32 is a special duty refrigerator compressor lubricant based on a blend of alkylated benzene and naphthenic mineral oil. It has a very good miscibility with refrigerants, which have only limited miscibility with conventional mineral oils.	<ul style="list-style-type: none"><li>Refrigerator compressors – Shell Clavus SD 22-12 32 is recommended for the lubrication of open, semi-open and hermetic compressors in domestic, commercial and industrial refrigeration systems with halogenated hydrocarbons (CFC, HCFC).</li><li>Special duty systems – Due to its superior miscibility it is particularly recommended for use in refrigeration systems operated with HCFC (R 22, R 502, R 13B1) etc., preferably at low evaporation temperatures and in systems without oil separator. Shell Clavus SD 22-12 32 has been used effectively in refrigeration systems operated with ternary blends based on R 22 like R 401A, R 401B, R 402A, R 402B and R 403A, R403B.</li></ul>	Shell Clavus SD 22-12 32 meets the requirements of DIN 51503 KC and KAA.  <b>Miscibility</b> Shell Clavus SD 22-12 32 is fully miscible with naphthenic mineral oils.
<b>Shell Clavus Oil AB 68</b>  Synthetic refrigerator compressor lubricant	Shell Clavus Oil AB 68 is a synthetic lubricants based on alkylated benzenes. They are particularly recommended for refrigerator compressors operating with ammonia and HCFC as refrigerant.	<ul style="list-style-type: none"><li>Refrigerator compressors – Shell Clavus Oil AB 68 is recommended for use in open, semi-open and hermetic compressors in domestic, commercial and industrial refrigeration systems. It can be used in both screw and reciprocating compressor types. Shell Clavus Oil AB 68 is designed for application with ammonia (R717) where it offers an excellent performance, even under high temperatures or below -33°C evaporation temperature.</li><li>Other refrigerants than ammonia – Shell Clavus Oil AB 68 is also fully suitable for use with halogenated refrigerants (CFC, HCFC). It may also be used in systems where hydrocarbon (e.g. R600a) is the refrigerant and with refrigerant R402A/B.</li></ul>	Shell Clavus Oil AB 68 meets the requirements of DIN 51503, KAA and KC.

GAS COMPRESSORS			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Madrela Oil T</b>  NZ ONLY  Synthetic lubricant for gas compressors	Shell Madrela Oil T has been specially developed for compressors handling hydrocarbon and other gases. It is based on polyalkylene glycol base fluids and is fully approved by leading gas compressor manufacturers.	Reciprocating gas compressors – Sump and lubrication systems of enclosed pattern compressors handling hydrocarbon and other gases where the crankcase and bearings operate in a gas atmosphere. Shell Madrela Oil T is suitable for compressors handling the following gases:  Methane, Butylene, Ethane, Butadiene, Ethylene, Vinyl chloride monomer (VCM), Propane Propylene, Ammonia, Inert gases (dry), Butane.  Special changeover procedures are required when moving from mineral oil-based products to Shell Madrela Oil T and vice versa.	Shell Madrela Oil T is approved by the following manufacturers of gas cargo and general service compressors:  <b>Sulzer Burckhardt AG</b> – Approved for use in their K-type gas compressors for general LPG/LNG service and for ammonia, vinyl chloride monomer and butadiene.  <b>Linde AG</b> – Approved for general service gas compression including ammonia, vinyl chloride monomer and butadiene.
SLIDEWAYS OILS			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Tonna Oil S</b>  68 220	Shell Tonna Oil S products are specially designed for the lubrication of machine tool slides and tables. They are based on highly refined mineral oils and contain additives to enhance their tackiness, anti-wear and stick-slip characteristics.	<ul style="list-style-type: none"><li>Machine tool slideways, tables and feed mechanisms – Developed for use on a wide range of materials used for machine tool slideway surfaces, including cast iron and synthetic materials.</li><li>Machine tool hydraulic systems Particularly recommended for machines which have a combined hydraulic and slideway lubrication system.</li><li>Machine tool gearboxes and spindles – Also suitable for gear and headstock lubrication. The lower viscosity grade (Shell Tonna Oil S 68) is intended for horizontal slide lubrication. For vertical slides use Shell Tonna Oil S 220.</li></ul>	Shell Tonna Oil S products meet the following specifications:  ISO/DIS 6743-13 DIN 51524 HLP DIN 51517 CLP  Approved by Cincinnati-Milacron and other machine tool manufacturers.

OVEN CHAIN LUBRICANTS			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
Shell Oven Chain Lubricant	<p>Shell Oven Chain Lubricant is a specialised lubricant containing graphite held in suspension by special surface-active agents in a water carrier. It is intended for the lubrication of drive chains in Bakers Ovens at elevated temperatures.</p> <p>Over many years various oil based or synthetic oil based products have been used in Bakers Ovens and initially they appear to perform the function, but over a period of time eventually oxidize and carbonize with exposure to high temperatures causing a build up on the link pins and ultimately sieze up.</p> <p>Some synthetic lubricants on heating give off a pungent obnoxious odour, which cannot be tolerated in Bakers Ovens.</p> <p>Shell Oven Chain Lubricant overcomes these problems as it has no strong odour; it does not carbonize to a hard skin; and it has been used in many Bakers Ovens satisfactorily for years providing a long chain life.</p>	<ul style="list-style-type: none"><li>• Baker's oven chains.</li><li>• High temperature lubrication of slides and chains.</li></ul>	

SUGAR MILL LUBRICANTS			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
Shell Sugar Mill Clear AUST ONLY	<p>Shell Sugar Mill Clear is a high performance, semi-synthetic, non-bitumastic viscous lubricant specifically developed to satisfy the demands of heavily loaded slow rotating journal bearings.</p> <p>Shell Sugar Mill Clear is formulated to minimize brass bearing and steel roller wear and maintain normal bearing temperatures under extreme operating conditions.</p> <p>Shell Sugar Mill Clear incorporates synthetic thickeners and high viscosity mineral oils blended with extreme pressure additives to give a modern high performance sugar mill brass bearing lubricant.</p>	Cost effective sugar mill oil for highly loaded and slow rotating sugar mill brass bearings and rollers, especially in total loss systems.	<p>Used very successfully for the lubrication of Steel journals on Bronze bearings in sugar mills. Applied by rotary type or injected type lubrication systems.</p> <p>Traditionally these are total loss systems.</p> <p>Application rates are determined by the effectiveness of seal arrangements</p> <p>Approved lubricant by Bundaberg Foundry. Sugar mill manufacturers.</p> <p>Viscosity @ 40 C 20,000 Cst. @100 C 425 Cst.</p>
Shell Sugar Mill Oil AUST ONLY	<p>Shell Sugar Mill Oil is a high performance, semi-synthetic, non-bitumastic viscous oil lubricant specifically developed for sugar mill brass bearing lubrication.</p> <p>Shell Sugar Mill Oil incorporates synthetic thickeners and high viscosity mineral oils blended with extreme pressure additives and molybdenum disulphide solids to give a modern high performance sugar mill brass bearing lubricant.</p> <p>Shell Sugar Mill Oil is formulated to minimize brass bearing and steel roller wear and maintain normal bearing temperatures under extreme operating conditions.</p>	Highly loaded and slow rotating sugar mill brass bearings and rollers.	<p>Widely used lubricant in Steel Journal on Bronze Bearings in Sugar Mills applied by either rotary or injected automated lubrication systems.</p> <p>Typically total loss systems. Application rates are determined by the effectiveness of sealing arrangements.</p> <p>An effective lubricant for Open gear applications where a splash or bath system is used.</p> <p>Approved lubricant by Bundaberg Foundry. Sugar Mill manufacturers.</p> <p>Viscosity @ 40 C 13,500 Cst. @ 100 C 325 Cst.</p>
Shell Malleus OGM (Heavy) NLGI 0 AUST ONLY	<p>Shell Malleus OGM (Heavy) NLGI 0 is specially formulated for use on mining Draglines and Shovels in open cut operations to perform even in hostile environments with the threat of severe dust and dirt contamination, water attack and changes in temperature.</p> <p>Resists drying, oxidation, and thermal decomposition, and is particularly suited to areas of high dust contamination or when typical weather conditions can cause peeling and "flaking" of conventional lubricants from racks, pinions, sticks, gears, and circle rails.</p>	<p>For use on draglines, shovels, excavators and other mining equipment in the following areas:</p> <ul style="list-style-type: none"><li>• Open gears.</li><li>• Sticks.</li><li>• Circle Rail and rollers.</li><li>• Antifriction bearings.</li><li>• Bushings.</li></ul> <p>Recommended for the lubrication of pinion gearing through spray systems.</p>	NLGI 0



DETERGENTS			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Dobatex Platinum</b>  AUST ONLY  Quick break detergent for heavy-duty mining and industrial applications	Shell Dobatex Platinum is a premium performance phosphorus-free detergent suitable for a wide range of heavy-duty applications.	Shell Dobatex Platinum is a premium performance detergent suitable for a wide range of cleaning requirements, including: Heavy and Light Mining Equipment, Heavy Truck Fleets and Machinery and Engine Degreasing. Shell Dobatex Platinum is formulated to provide premium performance results even when the water quality is poor.	Appearance      Green liquid Ph (1% m/v solution)   8
<b>Shell Dobatex Gold</b>  High performance general purpose cleaner	Shell Dobatex Gold is a water based, multi-purpose cleaning detergent suitable for a wide range of industrial and automotive applications including the heavier duty demands of mining equipment and fishing and trucking fleets through to routine janitorial cleaning.	Shell Dobatex Gold is highly adaptable to a wide range of cleaning requirements. One flexible product enables you to cut down on inventory, and with varying dilutions and application methods it is effective and safe for: <ul style="list-style-type: none"><li>• Truck fleets, cars and small commercial vehicles.</li><li>• Fishing fleets and marine leisure craft.</li><li>• Heavy and light mining equipment.</li><li>• Machinery and engine degreasing.</li><li>• Routine and janitorial cleaning purposes such as: flooring, commercial and home kitchens (including as a dishwashing fluid), cafeterias and bathrooms, food processing equipment, abbatoirs, fishing cooperatives, commercial food preparation areas, general purpose offices and office furniture cleaning solution.Shell Dobatex Gold is truly a multi-purpose detergent and cleaning fluid for almost all applications.</li></ul>	Specific gravity (@15°C) 1.10 pH (1% m/v solution) 10 Completely soluble in water DPI Approval for food contact areas Gold liquid Biodegradable to AS1792
<b>Shell Dobatex Truck Wash</b>  Premium quality transport vehicle detergent	Shell Dobatex Truck Wash is a water based, biodegradable, high performance detergent specially formulated for all transport cleaning applications including trucks, buses, cars, trains and trams.	Shell Dobatex Truck Wash is specifically designed for: <ul style="list-style-type: none"><li>• Truck fleets, buses, cars and small commercial vehicles.</li><li>• Trains and trams.</li><li>• Also suitable for automotive passenger cars.</li></ul>	Specific gravity (@15°C) 1.10 pH (1% m/v solution) 10.1 Completely soluble in water Red liquid Biodegradable to AS1792
<b>Shell Dobatex Aqua Degreaser</b>  Premium quality transport vehicle detergent	Shell Dobatex Aqua Degreaser is a water-based degreasing product formulated specifically for the removal of oil and grease in demanding applications in the general engineering, automotive and mining/construction industries.	Shell Dobatex Aqua Degreaser has been designed for the effective removal of grease and oil/dirt residues from: <ul style="list-style-type: none"><li>• Engineering parts and equipment.</li><li>• Automotive workshops and parts cleaning.</li><li>• Mining equipment.</li><li>• Mechanical parts.</li><li>• Factory and driveway floors where frequent oil stains may occur.</li></ul> Shell Dobatex Aqua Degreaser has been formulated to provide superior and cost-effective results.	Appearance      Clear Pink Liquid pH (1% solution)      6.5

DEGREASING FLUIDS			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Degreasing Fluid</b>  AUST ONLY  Premium performance degreasing fluid	Shell Degreasing Fluid is a premium performance degreasing fluid, which is designed to meet the stringent requirements of an oil and grease solvent and still maintain premium safety standards. Shell Degreasing Fluid incorporates a unique solvent base to penetrate oil and grease bound dirt. Shell Degreasing Fluid also contains an emulsifier, which permits easy removal with water.	Shell Degreasing Fluid is suitable for: <ul style="list-style-type: none"><li>• Cleaning and degreasing car, truck, bike and boat engines.</li><li>• Washing oily and greasy concrete floors and driveways.</li></ul>	Flash point      80°C Low volatility
<b>Shell Degreasing Fluid QB</b>  Multipurpose quick break degreasing fluid	Shell Degreasing Fluid QB is a powerful degreasing product specifically designed to remove heavy oils, greases and oily solids from a variety of hard surfaces.	Shell Degreasing Fluid QB is particularly suitable for the following applications: <ul style="list-style-type: none"><li>• Degreasing and pre-maintenance cleaning of both stationary and mobile equipment.</li><li>• Equipment cleaning for inspections.</li><li>• Parts degreasing during vehicle overhaul.</li><li>• Machinery and engine degreasing.</li><li>• Concrete floor and work area degreasing.</li></ul>	WARNING  A solvent trap must be used when removing Shell Degreasing Fluid QB with water. The flushings should never be allowed to go directly into drains.  Flash Point      >62°C
HAND CLEANER			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Hand Cleaner</b>	Shell Hand Cleaner is an industrial strength hand cleaner containing polymer beads to assist in dirt removal from the skin. It is free from petroleum solvents and its neutral pH makes it mild on hands.	Shell Hand Cleaner is suitable for every application from the home to the heaviest industrial workshop. It contains polymer beads which makes it highly effective in the removal of ingrained grease, oil and dirt.	Neutral pH

CONCRETE PARTING AGENTS AND SEALERS			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Moulding Oil O5</b> AUST ONLY	Shell Moulding Oil O5 is a distillate based, additive containing mould release fluid for use in the concrete, plaster and clay moulding industries.  It is mainly used as a mould parting agent for concrete tiles; and a die lubricant for extruding clay bricks, earthenware pipes and pressed bricks.  Shell Moulding Oil O5 can be applied to many types of mould or form surfaces by spraying, brushing or swabbing.	Parting agent for concrete tiles, die lubricant for extruding clay bricks, earthenware pipe and pressed bricks.	Low viscosity products for brushing, swabbing or spraying for concrete and clay.
<b>Shell Moulding Oil P5</b>	Shell Moulding Oil P5 is an oil based, additive containing mould release fluid used extensively for poured concrete structures with plywood, hardboard or steel shuttering.	Used extensively for poured concrete structures with plywood, hardwood or steel shuttering.	A general-purpose medium viscosity mould-parting agent.
<b>Shell Moulding Oil R20</b> AUST ONLY	Shell Moulding Oil R20 is a solvent based, additive containing mould release fluid, which dries to leave a resinous film on mould surfaces. It is primarily used in the manufacture of spun concrete pipes.  Shell Moulding Oil R20 can be applied by spraying, brushing or swabbing and can be diluted with Shell Diesoline, Mineral Turpentine or Household Kerosene.	A mould-parting agent for the manufacture of spun concrete pipes.	Pale-coloured, solvent-based fluid producing a resinous finish on mould surfaces.

PROCESS OILS										
PARAFFINIC PROCESS OILS										
BRANDS	DENSITY KG/L	COLOUR ASTM	KV@40°C	KV@ 100°C	VI	FLASH PT C.O.C.	ANILINE PT °C	HYDROCARBON ATOM ANALYSIS		
								CA	CN	CP
<b>Shell Catenex Oil S</b> 523	0.868	1.0	23	4.5		210	100	3	28	69
<b>Shell Catenex Oil S</b> 541 – AUST ONLY	0.888	4	100	11.2		240	112	4	28	68
<b>Shell Catenex Oil S</b> 579 – AUST ONLY	0.905	5.5	500	32		300	122	6	23	71
NAPHTHENIC AND PROCESS OILS										
BRANDS	DENSITY KG/L	COLOUR ASTM	KV@40°C	KV@ 100°C	VI	FLASH PT C.O.C.	ANILINE PT °C	HYDROCARBON ATOM ANALYSIS		
								CA	CN	CP
<b>Shell Edelex Oil</b> 212 – AUST ONLY	0.885	0.5	9	2.3		146	75	8	48	44
<b>Shell Edelex Oil</b> 256 – AUST ONLY	0.906	2.0	145	10.8		225	93	3	39	58
SPECIALITY – LOW AROMATIC, LOW VISIBILITY, HIGH FLASH POINT OILS										
BRANDS	DENSITY KG/L	COLOUR ASTM	KV@40°C	KV@ 100°C	VI	FLASH PT C.O.C.	ANILINE PT °C	HYDROCARBON ATOM ANALYSIS		
								CA	CN	CP
<b>Shell Process Oil P</b> 878 – AUST ONLY	0.807	+30 say.	2.42	1.09	–	106	82	0	42	58

TURBINE OILS			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Turbo Oil T</b>  32 46 68 – AUST ONLY 100 – AUST ONLY	Shell Turbo Oil T products have long been regarded as the industry standard turbine oil. Building on this reputation, Shell Turbo Oil T has been developed to offer performance capable of meeting the demands of the most modern non-geared steam turbine systems and light duty gas turbines.  Shell Turbo Oil T products are formulated from high quality hydrotreated base oils and a combination of zinc-free additives that provide excellent oxidative stability, protection against rust and corrosion, low foaming and excellent demulsibility.	Shell Turbo Oil T products are suited for application in the following areas: <ul style="list-style-type: none"><li>• Non-geared industrial steam turbines.</li><li>• Non-geared light duty gas turbines.</li><li>• Water turbine lubrication.</li><li>• Compressor applications.</li><li>• Numerous applications where strong control over rust and oxidation is required.</li></ul>	The performance of new Shell Turbo Oil T products meet or exceed a number of major steam and gas turbine manufacturer lubricant specifications including:  General Electric GEK 28143A, 32568F, 46506D Siemens – Westinghouse 21T0591 and 55125Z3 DIN 51515 part 1 and 2 ISO 8068 Solar ES 9-224U, class II GEC Alstom NBA P50001 JIS K2213 Type 2 BS 489-1999 ASTM D4304, Type I Siemens/Mannesmann Demag 800037 98 Approved by OEM against: Siemens TLV 9013 04 Alstom HTGD 90117 Man Turbo SP 079984 D0000 E9
<b>Shell Turbo Oil GT 32</b>	Shell Turbo Oil GT 32 has been developed for the most severe operating conditions imposed by modern, heavy-duty industrial gas turbines.	<ul style="list-style-type: none"><li>• Power and industrial heavy-duty gas turbines.</li><li>• Shell Turbo Oil GT 32 is used as lubricating oil for main shaft bearings and mechanical gears as well as governor oil in the turbine control valves in modern gas turbines.</li><li>• Shell Turbo Oil GT 32 may also be used for other industrial applications requiring a high performance gas turbine oil, such as the lubrication of turbo compressors.</li></ul>	Shell Turbo Oil GT 32 greatly exceeds the requirements from major turbine manufacturers specifications including:  ISO 6743/5 ISO-LTGB/-TGC DIN 51515-1, 51515-2 SIEMENS TLV 9013 04 ABB HTGD 90117S GEK 32568E SOLAR ES 9-224 U Class I
<b>Shell Turbo Oil CC</b>  32 – AUST ONLY 46	Shell Turbo Oil CC products have been developed to meet the severe demands imposed by modern, heavy-duty turbine applications, exceeding OEM specifications for both gas and steam turbines.  A patented, metal free additive technology, helps to ensure that this product offers substantially improved performance over conventional turbine oils.  Its unique combination of excellent oxidative stability, sludge control and surface properties make Shell Turbo Oil CC products the first choice lubricant for emerging combined cycle turbine technology, as well as existing gas and steam turbine plants.	<ul style="list-style-type: none"><li>• Power generation combined cycle turbines.</li><li>• Industrial steam turbines.</li><li>• Industrial gas turbines.</li></ul>	Shell Turbo Oil CC products exceed the major gas and steam turbine manufacturer lubricant specifications including:  General Electric GEK 28143 A, GEK 32568F, GEK 46506D, GEK 101941A Siemens-Vestinghouse 21 T0591 and 55125Z3 ABB STAL K-110-8121 08/09 Solar ES 9-224U, class II DIN 51515 parts 1 and 2 ISO 8068 GEC Alstom NBA P50001A JIS K-2213 Type 2 BS 489-1999 Siemens/Mannesmann Demag 800 037 98 Approved by OEM against: Siemens TLV 9013 04 Alstom HTGD 90 117
<b>Shell Turbo Oil J 32</b>  AUST ONLY  Premium industrial turbine oil	Shell Turbo Oil J 32 has been specially formulated to satisfy the demanding requirements of the MHI (Mitsubishi Heavy Industry) non-geared steam and gas turbines. This is based on a blend of specially chosen high quality hydrotreated base oils with selected additives to enhance their rust and oxidation properties.	<ul style="list-style-type: none"><li>• Power generation MHI turbines.</li><li>• Shell Turbo Oil J 32 may also be used for other industrial applications requiring high quality rust and oxidation (R and O) inhibited oils, which separate easily from water.</li></ul>	Shell Turbo Oil J 32 meets the requirements of MHI turbines and has been successfully tested in the MHI in-house dry TOST test.  Shell Turbo Oil J 32 meets the requirements of MHI specification turbine oil type 2 (additive) against MS04-MA-CL001 (R-O) and MS04-MA-CL002 (R-O).

OPEN GEAR LUBRICANTS			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Malleus GL</b>  25 300 400 – AUST ONLY 500	Shell Malleus GL products are a range of a premium quality, lead and solvent free, full EP lubricants developed for the lubrication and protection of open gears and wire ropes subjected to extremes of ambient temperature and operating conditions.  They are a unique blend of high quality paraffinic mineral and synthetic base oils with carefully selected additives to provide optimum performance. Its balanced formulation allows the lubricant to stay soft and pliable over long periods, thus eliminating the build-up of lubricant in the roots of the gear teeth.	Heavily loaded open gears, particularly those found in grinding mills, kilns, shovels, draglines, ship loaders, stackers and reclaimers and excavator applications. When choosing a product to suit your ambient temperature conditions, always consult with your Shell representative for the appropriate grade. <ul style="list-style-type: none"><li>• Multi-service lubricant that can be used as the one grease (multi purpose and open gear) for the entire machine on most shovels, excavators and draglines (excluding electrical motors bearings).</li><li>• Surface dressing of slow moving gears open to the atmosphere.</li><li>• Plain bearings, pivot pins/bushings and articulations found in earth moving equipment.</li><li>• Mooring, static and slow moving wire ropes including those intermittently immersed in salt water.</li><li>• Wide variety of heavy-duty mining and industrial applications.</li></ul>	Shell Malleus GL has been approved by following OEMs:  FLSmidth (Malleus GL 500, 400) Metso – Svedala (Malleus GL 500, 400) Norberg (Malleus GL 400) Ferry Capitain (Malleus GL 500, 400) Falk (Malleus GL 400) Lincoln (All Malleus GL)
<b>Shell Malleus OGM (Heavy) NGLI 0</b>  AUST ONLY	Shell Malleus OGM (Heavy) NGLI 0 is specially formulated for use on mining Draglines and Shovels in open cut operations to perform even in hostile environments with the threat of severe dust and dirt contamination, water attack and changes in temperature.  Resists drying, oxidation, and thermal decomposition, and is particularly suited to areas of high dust contamination or when typical weather conditions can cause peeling and “flaking” of conventional lubricants from racks, pinions, sticks, gears, and circle rails.	For use on draglines, shovels, excavators and other mining equipment in the following areas: <ul style="list-style-type: none"><li>• Open gears.</li><li>• Sticks.</li><li>• Circle Rail and rollers.</li><li>• Antifriction bearings.</li><li>• Bushings.</li></ul>	NGLI 0

DRAGLINE LUBRICANTS			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Dragline Rope Oil XPL</b> AUST ONLY	Shell Dragline Rope Oil XPL is a premium quality, high performance wire rope lubricant developed specifically for the protection and lubrication of running wire ropes on large walking draglines operating in the Australian coal mining industry.  Shell Dragline Rope Oil XPL is a carefully balanced formulation of highly refined paraffinic base oils blended with selected performance-enhancing additives designed to prolong the life of hard working dragline wire ropes.	Wire Ropes on draglines.	
<b>Shell Dragline Rope Oil Heavy</b> AUST ONLY	Shell Dragline Rope Oil Heavy is a premium quality, high performance wire rope lubricant developed specifically for the protection and lubrication of running wire ropes on large walking draglines operating in the Australian coal mining industry.  It is also suitable for shovels and other similar applications where wire ropes are used.	Wire Ropes on draglines and shovels.	
<b>Shell Mine Gear 320</b> AUST ONLY Extreme pressure industrial gear oil	Shell Mine Gear 320 is a premium quality, semi synthetic, extreme pressure (EP) gear oil specifically developed for heavily loaded gear cases operating in the mining industry.	Heavily loaded gear cases.	
<b>Shell Mine Gear 1500</b> AUST ONLY Extreme pressure industrial gear oil	Shell Mine Gear 1500 is a premium quality, semi synthetic, extreme pressure (EP) gear oil which is specifically developed for the enclosed gearboxes on walking draglines in the mining industry but can also be used in any large, low speed, high loaded industrial gearbox.  Shell Mine Gear 1500 has been formulated without the use of lead containing additives.	<ul style="list-style-type: none"><li>Enclosed gearboxes on walking draglines.</li><li>Large, low speed highly loaded industrial gearboxes.</li></ul>	Marion GL-250a    Meets requirements

STEAM CYLINDER OILS			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Valvata Oil J</b> 460 680 – NZ ONLY	Shell Valvata Oil J products are a quality refined, high viscosity mineral oils compounded with a small percentage of fatty oils.  They are used, primarily, for the lubrication of steam cylinders working under high temperature, high pressure conditions, where low carbon formation and ‘steam washing’ are important considerations.  They atomize more easily and with steam of moderate superheat and produce more tenacious lubricating films than ‘straight’ grades of the same viscosity.	<ul style="list-style-type: none"><li>Steam cylinder lubrication.</li><li>Low speed enclosed gears.</li><li>Certain worm gears.</li></ul>	
<b>Shell Valvata Oil 1000</b>	Shell Valvata Oil 1000 is a refined high viscosity mineral oil blended primarily for the lubrication of steam cylinders working under high temperature, high-pressure conditions and where low carbon formation is an important factor.	<ul style="list-style-type: none"><li>Steam cylinder lubrication.</li><li>Industrial gears where the use of high viscosity ‘straight’ grades are recommended.</li><li>Low speed enclosed gears.</li></ul>	
ROAD DRILL OILS			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Torcula Oil</b> 32 – NZ ONLY 100 320 – AUST ONLY	Shell Torcula Oil(s) has been developed to meet the special lubrication requirements of all percussion type pneumatic tools, including those subjected to the most arduous conditions.  They are based on a blend of highly refined mineral oils and selected additives chosen for their ability to maintain high oil film strength and effectively lubricate the demanding requirements of pneumatic drill impact mechanisms.	Percussion type pneumatic tools, including those used for rock drilling <ul style="list-style-type: none"><li>Oil mist lubrication systems and air tools.</li><li>Air tools.</li><li>Gear and bearing lubrication systems subject to water ingress.</li></ul>	Approved by Gardner-Denver and other pneumatic tool manufacturers



CORROSION PREVENTATIVES			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
Shell Rustkote Fluid 945	Shell Rustkote Fluid 945 is a solvent deposited type rust preventive fluid with dewatering properties.  It is based on a blend of selected rust prevention materials dissolved in a solvent for ease of application.  It evaporates and leaves the protective film on the applied surfaces.	Shell Rustkote Fluid 945 is suitable for rust protection of the manufactured components.  It can be applied by dipping, spraying or brushing any dried parts as well as the components passed a coolant machining process that required a dewatering property.  It is also recommended for the intermediate rust prevention between machining works.  Rust protection of machined metal parts and finish products.	
Shell Ensis Fluid V	Shell Ensis Fluid V is blended of selected rust prevention components dissolved in a low-flash point solvent.  Shell Ensis Fluid V is specially intended for very long-term internal and long-term external protection.	<ul style="list-style-type: none"><li>Shell Ensis Fluid V is suitable for long-term protection of steel and cast iron components during storage and shipment.</li></ul>	ISO 6743-8 (1987): ISO-L-RM category.
Shell VSI 8235 Concentrate  AUST ONLY	Shell VSI 8235 Concentrate is an oil soluble concentrate that has the ability to protect steel surfaces which are above the normal oil level in a system – the vapour spaces in an oil storage tank or the oil reservoir in a circulation system would be examples.  Shell VSI 8235 Concentrate is recommended for use in all enclosed oil lubrication systems where rusting is likely to occur because of the presence of steam condensate or atmospheric moisture in the system.	Typical applications are: <ul style="list-style-type: none"><li>Oil lubricated rolling bearing and gear housings, reservoirs, oil piping, and similar circulation system components.</li><li>Machine tool housings where the machines may be idle over a weekend or for even longer periods of time.</li><li>Steam turbine lubrication systems where corrosion of oil gravity tanks or oil storage tank walls and overheads is occurring.</li><li>Any machinery that is actually idle or in intermittent use and which is therefore susceptible to rusting because the oil in use gradually drains down from internal surfaces.</li></ul>	<b>Recommended Dosage</b> Shell VSI 8235 is recommended for use at 2% volume solution and is added to the existing oil already in the equipment.  It should not be used at higher concentrations as this may result in equipment damage.

CUTTING OILS – WATER EXTENDABLE									
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS						
Shell Dromus BL	<p>Shell Dromus BL is a soluble oil which forms stable emulsions with water for use as a coolant and lubricant in metalworking operations.</p> <p>Shell Dromus BL can be used in all cutting operations where a soluble oil without EP properties is applicable.</p>	<p>Shell Dromus BL can be used for the majority of general machining processes – for example drilling, milling, turning, boring and cold sawing of the more common materials.</p> <p>It may also be used for grinding applications.</p>							
Shell Adrana D 208	<p>Shell Adrana D 208 is a high quality, general-purpose metalworking fluid for easy to medium duty applications on ferrous metals.</p> <p>Shell Adrana D 208 is a high quality multipurpose coolant, which easily disperses in water.</p> <p>It provides a stable, odourless micro-emulsion with high detergency and extremely good anti-foam and cooling properties.</p> <p>Those characteristics, together with a good resistance to microbiological degradation, make Shell Adrana D 208 suitable for use in medium to severe machining operations on cast iron and steel alloys.</p>	<p>Recommended for use in easy to medium duty operations on cast iron and (low to medium alloyed) ferrous metals. It is designed for use on CNC machine tools, due to its excellent detergency and high wetting properties.</p> <p>It is suitable for all removal and grinding operations and is employable over a broad water hardness range.</p>	<p><b>Recommended Concentrations</b></p> <p>The concentration varies depending on the type of machining operation, the water hardness and the required inter-operational corrosion protection. The recommended concentration for use in medium water hardness is:</p> <table><tr><td>General machining:</td><td>4 – 6 %</td></tr><tr><td>Severe cutting operations:</td><td>5 – 8 %</td></tr><tr><td>Grinding:</td><td>3 – 5 %</td></tr></table> <p><b>Storage</b></p> <p>The product should be stored inside (5 – 40°C) for no more than 1 year and be protected from freezing.</p>	General machining:	4 – 6 %	Severe cutting operations:	5 – 8 %	Grinding:	3 – 5 %
General machining:	4 – 6 %								
Severe cutting operations:	5 – 8 %								
Grinding:	3 – 5 %								
Shell Lubricool Yellow HW  AUST ONLY	<p>Shell Lubricool Yellow HW metalworking fluids are internationally tried and proven products designed to exceed the rigorous demands of today's manufacturing requirements.</p> <p>Colour-coded for easy application, this new range of water miscible cutting and grinding fluids have been developed using the latest in biostable and additive technology to give long fluid life and low maintenance. Exceptional resistance to bacterial and fungal growth, with superior performance characteristics, are what you can expect from the new Shell Lubricool range, which is designed to be operator friendly and help maintain a clean working environment.</p> <p>Shell Lubricool Yellow HW is a semi-synthetic, biostable, extreme pressure (EP) metal working fluid, designed for use in areas of very high water hardness. When mixed with water Shell Lubricool Yellow HW forms a stable, translucent, yellow emulsion.</p> <p>Shell Lubricool Yellow HW has been formulated to include extremely effective EP additives for heavy-duty operations where surface finish and extended tool life are prerequisite to manufacturing requirements.</p>	<p>Shell Lubricool Yellow HW is recommended for heavy-duty applications, such as gear cutting, threading and deep hole drilling. Shell Lubricool Yellow HW is also recommended for some stamping and forming operations.</p> <p>Shell Lubricool Yellow HW is also suitable for general purpose machining of tough alloy and stainless steels.</p>	<p><b>Recommended Dilutions:</b></p> <table><tr><th>Application</th><th>Concentration</th></tr><tr><td>General Machining</td><td>3 – 5%</td></tr><tr><td>Heavy-duty Machining</td><td>5 – 10%</td></tr></table>	Application	Concentration	General Machining	3 – 5%	Heavy-duty Machining	5 – 10%
Application	Concentration								
General Machining	3 – 5%								
Heavy-duty Machining	5 – 10%								

CUTTING OILS – WATER EXTENDABLE (continued)			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
Shell Lubricool Green	Shell Lubricool Green metalworking fluids are internationally tried and proven products designed to exceed the rigorous demands of today's manufacturing requirements.	Recommended for all metals and provides exceptional performance resulting in high quality surface finish over a wide variety of grinding applications.	Recommended Dilutions:
	Colour coded for easy application, this new range of water miscible cutting and grinding fluids have been developed using the latest in biostable and additive technology to give long fluid life and low maintenance.	Shell Lubricool Green is designed for use on most ferrous and non-ferrous materials.	ApplicationConcentration
	Exceptional resistance to bacterial and fungal growth, with superior performance characteristics, are what you can expect from the new Shell Lubricool range, which is designed to be operator friendly and help maintain a clean working environment.	When mixed with water, Shell Lubricool Green forms a stable transparent green solution. It is low foaming, provides excellent corrosion protection at low concentrations and has the ability to quickly settle fine particles and grinding wheel debris. It is suitable for hard and soft water conditions.	Surface andCylindrical Grinding3 – 5%Centreless Grinding3 – 5%Form Grinding5 – 10%
CUTTING OILS – NEAT			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
Shell Macron GP 32	Shell Macron GP 32 consists of a mineral oil fortified by a combination of chemically active additives to enhance its load carrying properties.	• High performance general cutting operations.  • Automatic and semi-automatic machine tool operations.	
Shell Macron C22 AUST ONLY	Shell Macron C22 is a low viscosity, extreme pressure, neat cutting oil, manufactured from a blend of highly refined mineral oil and EP additives.  It is formulated to suit a wide range of applications.	Shell Macron C22 is recommended for the following operations, where conditions are Moderate:  • Multi Spindle Application.  • Gear Cutting.  • Tapping and Threading.  • Thread Rolling.  • Deep Drilling.  • Suitable for machining of non-ferrous and yellow metals.	

HEAT TREATMENTS AND QUENCHING OILS			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
Shell Catenex S 523	Shell Catenex S 523 is a paraffinic process oils manufactured via the solvent extraction process.  They are general-purpose process oils as extender or carrier fluids.		
OUTDOOR POWER EQUIPMENT LUBRICANTS			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
Shell Lawn 2 Mower Oil	Shell Lawn 2 Mower Oil is a versatile high performance 2-stroke engine oil. It is a low ash lubricant capable of meeting the demands of 2-stroke engines, especially motor mowers, ranging from small air cooled units to sophisticated high horsepower models.  2-stroke engine oil for lawn mowers and chainsaws	Shell Lawn 2 Mower Oil is recommended for 2-stroke lawn mowers, chain saws, brush cutters and other similar 2-stroke engine powered implements.	JASO FB
Shell Lawn 4 Mower Oil	Shell Lawn 4 Mower Oil is a versatile high performance 4-stroke engine oil, that meets the performance requirements of Briggs and Stratton.  4-stroke engine oil for outdoor power equipment	Shell Lawn 4 Mower Oil is specially designed for 4-stroke lawn mower engines where an SAE 30 monograde and API SF or below are required.	API SF/CC
Shell Chainsaw Bar Oil	Shell Chainsaw Bar Oil protects bars and chains of high performance power saws.  Lubricates cutter chains and bars of chainsaws	A blend of high quality mineral base oil and anti-wear additive formulated to protect chain links and sprockets, tackifier to keep oil fly off to a minimum and corrosion inhibitors to provide good protection against rust.	
OTHER OILS AND FLUIDS			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
Shell Calibration Fluid S9365	For the testing and calibration of diesel fuel injection pumps and injectors and as a run – out fuel for diesel engines being shut down or stored for a period.  Product incorporates corrosion inhibitors which provide protection for the fuel system and is formulated to provide: <ul style="list-style-type: none"><li>• Good storage stability to avoid oxidation deposits.</li><li>• Low pour point.</li><li>• Closely controlled viscosity characteristics.</li><li>• Minimal risk of skin complaints.</li></ul> Diesel pump and injector calibration fluid	Shell Calibration Fluid S9365 is a diesel injector pump test, calibration and run-out fluid for diesel pumps and injectors.	ISO 4113 SAE J967D CAV Specification Bosch Mercedes Benz Meets Meets 7-10-106 VS 15665 OL Sheet 133

ELECTRO-MECHANICAL VARIABLE SINGLE POINT LUBRICATORS			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Tactic EMV</b>  Single point automatic lubricators  TACTIC EMV DRIVE UNIT (MULTI-USE)  Pack: Cartons of 10 units  TACTIC EMV GREASE CANISTERS (SINGLE USE)  M120 – 120cc grease L250 – 250cc grease  Packs: Cartons of 10 units  GREASE TYPES  Shell Stamina EP2 250cc Shell Stamina RL2 120cc and 250cc Shell Albida EP 2 250cc Shell Albida HDX2 250cc	<p>The Shell Tactic EMV range of Single Point Automatic Lubricators deliver a specific volume of grease over a set period of time via a reliable and accurate electro-mechanical drive unit, which has variable timer functionality.</p> <p>Shell Tactic EMV comprises three primary components: 1) Re-useable electro-mechanical drive unit, 2) Single-use grease canister and 3) Single-use power pack.</p> <p>The grease delivery rate is variable via 4 timer settings (1M, 3M, 6M and 12M) and 2 grease canister size options (120cc and 250cc).</p> <p>The broad range of dispensing rates provides versatility. For example: For electric motor bearings select the 120cc canister and a 12 month setting. For large bearings and seals operating in harsh environments select the 250cc canister and a 1 month setting.</p>	<p>Bearings including pulleys, electric motors, gearboxes, conveyors.</p> <p>Seals</p>	<p>Ambient temperature range      -10°C to +50°C</p> <p>Pressure output as required      5 bar rising to 8 bar</p> <p>Settings      1, 3, 6 and 12 Months for 120cc and 250cc volume</p> <p>Remote mounting      Up to 3 meters</p> <p>Thread ype      1/4" BSP</p> <p>Power pack      3 x 1.5V Duracell</p> <p>Power      Cell batteries (bonded)</p> <p>Water resistance      IP 65</p>
ELETRO-CHEMICAL-GAS SINGLE POINT LUBRICATORS			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Tactic ECG Stamina EP2</b>  1 month (Yellow) 3 months (Green) 6 months (Red)  GREASE TYPES: Shell Stamina EP2 100cc	<p>Shell Tactic ECG Stamina EP2 is a simple to use, reliable gas type lubricator.</p> <p>It is robust, fully water and dust proof and compact to allow for direct installation to most bearings.</p> <p>It has no electrical components and no batteries. The body of the unit is transparent to allow easy viewing of the grease plunger position.</p> <p>The design of the German manufactured Shell Tactic ECG incorporates an expandable bladder, which fully contains the generated gas and forces the double-sealed grease plunger forward. In addition, the color-coded activators prevent confusion and errors associated with dispensing rate settings.</p> <p>Shell Tactic ECG is filled with high performance Shell Stamina EP2 grease, making it suitable for a broad range of applications and bearing operating conditions including high temperatures, high loads, vibrations and shock loading.</p>	<p>Bearings including pulleys, electric motors, gearboxes, conveyors.</p> <p>Seals</p>	<p>Average ambient temperature range      0°C to 40°C</p> <p>Dispensing rate affected by temperature.</p> <p>Pressure output      4 bar</p> <p>Settings      1, 3 and 6 months for 100cc volume</p> <p>Remote mounting      Up to 1 meters</p> <p>Thread type      1/4" BSP</p>

FOOD GRADE OILS			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Cassida Chain Oil</b>  150 1000 – Aerosol 400ml pack	<p>Shell Cassida Chain Oil(s) are fully synthetic, high performance anti-wear chain oils, which have been specially formulated for the lubrication of drive and transport chains in the food industry.</p> <p>They are based on a careful blend of synthetic fluids and selected additives chosen for their ability to meet the stringent requirements of the food industry.</p>	<ul style="list-style-type: none"><li>• Drive and transport chains in the food Industry.</li><li>• Also intended for use in equipment manufacturing food packaging.</li></ul>	<ul style="list-style-type: none"><li>• Krones</li><li>• Frigoscandia</li><li>• Stork</li><li>• NSF H1</li><li>• Kosher</li><li>• Hala</li><li>• AQIS</li></ul>
<b>Shell Cassida Fluid CR 46</b>	<p>Shell Cassida Fluid CR 46 is a high performance fluid specially developed for use in rotary screw and vane air compressors used in the food and beverage processing and packaging industry.</p> <p>It is based on a careful blend of synthetic fluids and selected additives chosen for their ability to meet the stringent requirements of the food industry.</p>	<ul style="list-style-type: none"><li>• Screw and vane compressors.</li><li>• Plain and anti-friction bearings.</li><li>• General purpose lubrication including light duty gearboxes.</li></ul>	<ul style="list-style-type: none"><li>• NSF H1</li><li>• Kosher</li><li>• Halal</li><li>• DIN 51506 VBL, VCL, VDL</li></ul> <p>Extensive field experience for:</p> <ul style="list-style-type: none"><li>– Atlas Copco</li><li>– Grassair</li><li>– Compare</li><li>– Ingersoll Rand</li><li>– Kaeser/HPC</li></ul> <ul style="list-style-type: none"><li>• FAG recommendation</li><li>• AQIS</li></ul>
<b>Shell Cassida Fluid GL</b>  220 460	<p>Shell Cassida Fluid GL products are high performance, anti-wear gear oils specially developed for the lubrication of enclosed gears in food and beverage processing machinery.</p> <p>They are based on a careful blend of synthetic fluids and selected additives chosen for their ability to meet the stringent requirements of the food industry.</p>	<ul style="list-style-type: none"><li>• Lubrication of enclosed gearboxes used in the food industry.</li><li>• Also intended for use in equipment manufacturing food packaging.</li></ul>	<ul style="list-style-type: none"><li>• NSF H1</li><li>• Kosher</li><li>• Halal</li><li>• AQIS</li><li>• ISO/DP 6743/6</li><li>• DIN 51517 CLP</li><li>• DIN 51506 VBL (GL 150, 220)</li><li>• DIN 51506 VCL (GL 150)</li><li>• David Brown: Shell Cassida GL 460 for worm gears</li><li>• Lenze</li><li>• Getriebebau Nord: Shell Cassida GL 220</li><li>• Flender, Krones</li><li>• SEW (GL220 for helical units and GL460 for worm gear units)</li><li>• Bonfiglioli (for parallel shaft and helical In-line reducers; Shell Cassida GL 460 for worm or worm/screw gears)</li><li>• FMC can seamers (viscosity for different models according to OEM specification)</li><li>• FAG and Buehler recommendation</li><li>• Westfalia Food Tec (Shell Cassida GL 220)</li><li>• Toyo Can Seamer type 43M (Shell Cassida GL 150)</li><li>• Stork Food and Dairy Systems (GL 150-680)</li></ul>

FOOD GRADE OILS (continued)			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Cassida Fluid HF</b>  15 32 – AUST ONLY 46 100	Shell Cassida Fluid HF is a high performance, anti-wear multi-purpose lubricants, specially developed for use in machinery used in the food and beverage processing and packaging industry.  They are based on a careful blend of synthetic fluids and selected additives chosen for their ability to meet the stringent requirements of the food industry.	<ul style="list-style-type: none"><li>Hydraulic systems.</li><li>Hydrostatic gears.</li><li>Plain and anti-friction bearings.</li><li>General purpose lubrication including light duty gearboxes.</li><li>Circulating oil systems.</li></ul>	<ul style="list-style-type: none"><li>NSF H1</li><li>Kosher</li><li>Halal</li><li>AQIS</li><li>DIN 51524 HLP (except HF 15)</li><li>DIN 51524 HVLP (except HF 15)</li><li>DIN 51517 CLP (HF 68, 100)</li><li>ISO 6743/4 HM / HV</li><li>BS 6413/4 HM</li><li>Krones</li><li>David Brown</li><li>Buehler Utzwil</li><li>Mannesmann Rexroth (for axial piston pumps)</li><li>FAG</li><li>Ferrum (can seamer Cassida HF 100)</li><li>FMC (can seamer, viscosity see to OEM specification)</li><li>Westfalia Food Tec</li><li>Hawe Hydraulic pumps</li><li>Hoegger Alpina hydraulic pumps</li><li>Piller Industrieventilatoren GmbH (Cassida HF46)</li><li>Poclain-Hydraulics (Cassida HF 46)</li><li>Grégoire (A Kverneland Group Company) for their harvesting machinery</li><li>GEA Niro atomisors (Cassida HF 32-68)</li><li>Stork Food and Dairy Systems (Cassida 15-100)</li><li>Mitsubishi Caterpillar Forklift Europe</li></ul>
<b>Shell Cassida Fluid PL</b>  AUST ONLY Aerosol 400ml pack	Shell Cassida Fluid PL is a special lubricant with excellent creeping and penetrating features.  It is based on a careful blend of synthetic fluids and selected additives chosen for their ability to meet the stringent requirements of the food industry.	<ul style="list-style-type: none"><li>Disassembling of screws, interlocking nuts and other components.</li><li>Corrosion protection of metal components.</li><li>Lubrication of various non-demanding applications.</li></ul>	<b>Specifications and Certificates:</b> <ul style="list-style-type: none"><li>NSF H1</li><li>Kosher</li><li>Halal</li><li>AQIS</li></ul>
<b>Shell Cassida Silicone Fluid</b>  Aerosol 400ml pack	Shell Cassida Silicone Fluid is a Multi-purpose Silicone Fluid in an aerosol spray can, for use on food manufacturing machinery.  It is a fully synthetic, high performance multipurpose fluid, which has been specially formulated for the food industry to lubricate conveyors, slow-rotating machinery, small, slow speed bearings and pivot points.  It is based on a careful blend of synthetic components chosen for their ability to meet the stringent requirements of the food industry.	<ul style="list-style-type: none"><li>General maintenance lubricant.</li><li>Conveyor lubrication.</li><li>Slow rotating machinery and slow speed bearings.</li><li>Pivot points.</li></ul>	<b>Specifications and Certificates:</b> <ul style="list-style-type: none"><li>NSF H1</li><li>Kosher</li><li>Halal</li><li>AQIS</li></ul>

FOOD GRADE OILS (continued)			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Cassida Fluid GLE</b>  150 220  Enhanced performance gear lubricants for use in food manufacturing equipment	Shell Cassida Fluid GLE products are a fully synthetic, high performance, anti-wear gear lubricants, which were specifically designed for use in the food and beverage canning industry.  They are based on a careful blend of synthetic fluids and selected additives chosen for their ability to meet the stringent requirements of the food industry.  Registered by NSF (Class H1) for use where there is potential for incidental food contact. These products meet the guidelines (1998) of the US Department of Agriculture Food Safety and Inspection Service (USDA FSIS) for H1 use (lubricant with incidental food contact). These products contain only substances permitted under US 21 CFR 178.3570, 178.3620 and 182 for use in lubricants with incidental food contact.	<ul style="list-style-type: none"><li>Lubrication of rotary can seaming machines equipped with either enclosed (re-circulating) and total loss systems.</li><li>Circulating and bearing oil systems where contamination with water or food juice can occur, such as citrus juice extraction machines.</li></ul>	<b>Specifications and Certificates:</b> <ul style="list-style-type: none"><li>NSF H1</li><li>Kosher</li><li>Halal</li><li>DIN 51517 CLP</li><li>AQIS</li></ul> <b>Approvals and Recommendations:</b> <ul style="list-style-type: none"><li>Approved by Angelus Sanitary Can Seaming Company for can seamer lubrication. Angelus specifically recommends Shell Cassida Fluids GLE products for use where H1 food grade products are required</li><li>Approved by FMC for can seamer lubrication</li><li>Approved by FMC Citrus for the lubrication of citrus juice extractor machines</li></ul>
<b>Shell Cassida Fluid VP 100</b>  NZ ONLY  Synthetic lubricant for use in vacuum pumps in the food manufacturing machinery	Shell Cassida Fluid VP 100 is a high performance fluid specially developed for use in vacuum pumps used in the food and beverage processing and packaging industry. It is based on a careful blend of synthetic fluids and selected additives chosen for their ability to meet the stringent requirements of the food industry.  Registered by NSF (Class H1 for use where there is potential for incidental food contact. These Products contain only substances permitted under US 21 CFR 178.3570, 178.3620 and 182 for use in lubricants with incidental food contact. They also meet the former guidelines (1998) of the US Department of Agriculture for Food Safety and Inspection Service (USDA) for H1.	Vacuum pumps which produce medium vacuum.	<b>Specifications and Certificates:</b> <ul style="list-style-type: none"><li>NSF H1</li><li>Kosher</li><li>Halal</li><li>DIN 51506 VBL, VCL, VDL</li><li>ISO 6743-3A DAG, DAH, DAJ</li><li>AQIS</li></ul> <b>Approvals and Recommendations:</b> <ul style="list-style-type: none"><li>Busch</li><li>Rietschle</li><li>Tetra-Pak</li></ul>
<b>Shell FM TLS 150</b>  AUST ONLY  Speciality gear lubricant for use in food manufacturing equipment	Shell FM TLS 150 is a speciality anti-wear gear lubricant, which is specifically designed for use in the food and beverage canning industry. It is based on a careful blend of fluids and selected additives chosen for their ability to meet the stringent requirements of the food industry.  Registered by NSF (Class H1) for use where there is potential for incidental food contact. This product meets the guidelines (1998) of the US Department of Agriculture Food Safety and Inspection Service (USDA FSIS) for H1 use (lubricant with incidental food contact). These products contain only substances permitted under US 21 CFR 178.3570, 178.3620 and 182 for use in lubricants with incidental food contact.	<ul style="list-style-type: none"><li>Lubrication of rotary can seaming machines equipped with total loss systems.</li><li>Circulating and bearing oil systems where contamination with water or food juice can occur, such as citrus juice extraction machines.</li></ul>	<b>Specifications and Certificates:</b> <ul style="list-style-type: none"><li>NSF H1</li><li>Kosher</li><li>Halal</li><li>DIN 51517 CLP</li></ul>



MEDICINAL WHITE OILS			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Ondina Oil</b>  15 32 68	Shell Ondina Oil(s) are highly refined, non-stabilised, aromatic-free paraffinic or naphthenic white mineral oils complying with the stringent pharmacopoeia purity requirements.  Shell Ondina Oil(s) can be used in pharmaceutical, food packaging, cosmetic and other applications, where this high purity is required by legislation or important for the quality of the finished product.	<ul style="list-style-type: none"><li>• Components in cosmetic creams, lotions, oils, toiletries, etc.</li><li>• Food packaging – extender oil in polystyrene and other plastics, price labels.</li><li>• Hygiene articles - extender oil in thermoplastic TPE (e.g. SIS, SEPS), TPV and other Elastomers.</li><li>• Technical applications and car components – carrier fluid and extender oil for a variety of high-quality applications, where colour and stability is important (suitable when PVC is replaced by TPE elastomers).</li><li>• Toys and similar articles – extender oil in TPE elastomers (e.g. SBS, SEBS).</li><li>• Machinery lubrication.</li></ul> <p>The use of medicinal white oils in direct and indirect food applications (e.g. as food additives or for food packaging) is regulated by international specifications supplemented by local legislation. These requirements may deviate from country to country and must be taken into account by the user.</p>	<ul style="list-style-type: none"><li>• European Pharmacopoeia 3rd Edition</li><li>• Japanese Pharmacopeia XIII (68)</li><li>• US Pharmacopoeia 23rd Edition</li><li>• US FDA §172.878 (“White Mineral Oil”) for direct food contact</li><li>• US FDA §178.3620(a) for indirect food contact</li><li>• FDA specifications, where above specified oils are positively listed e.g. 173.340, 175.105, 175.210, 175.230, 175.300, 176.170, 176.180, 176.200, 176.210, 177.1200, 177.2260, 177.2600, 177.2800, 178.3120, 178.3570, 178.3740, 178.3910, 573.680.</li><li>• UK ‘The Mineral Hydrocarbon in Food Regulations 1966’</li><li>• European Directive 2002/72/EC for plastic materials coming into contact with foodstuffs (68)</li></ul>
PETROLATUM			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Snow White Petroleum Jelly</b>	Shell Snow White Petroleum Jelly is a cosmetic and food grade petrolatum.	<p>The main applications for Shell Snow White Petroleum Jelly are ointments, barrier creams, hair preparations and as a component in many other pharmaceutical applications.</p> <p>Shell Snow White Petroleum Jelly is also used in bakery, confectionary, and other food processing areas as a release agent and lubricant.</p>	<p>Pharmacopoeia</p> <p>Complies with the British and US Pharmacopoeia</p>

AVIATION

Shell in Australia distributes a range of AeroShell aviation oils, fluids and greases direct to small and large customers nation wide.

As specific details of aviation products vary from time to time, please contact Craig Rudolph – AeroShell Regional Account Manager on +61 2 9693 1317, or email Craig.Rudolph@shell.com if you have specific questions about the suitability and availability of AeroShell products.

For a comprehensive e-book – The AeroShell Book – which gives detailed information on the full AeroShell product range, please send an email to aeroshellbook@shell.com

LOW SPEED ENGINE OILS – MARINE			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Alexia 50</b>  Premium marine diesel engine cylinder oil	Shell Alexia 50 is a premium quality cylinder lubricant designed for use in all low speed crosshead diesel engines which burn residual fuel with sulphur content higher than 1.5% weight.  It is particularly suitable for the new generation of highly rated, fuel efficient, low speed marine diesel engines operating with higher pressures, and higher liner wall temperatures.  Shell Alexia 50 is blended from high viscosity index base oils and additive technology developed by Shell.	Cylinder lubrication of low speed marine diesel engines, which burn residual fuel with a sulphur content of between 1.0 to 4.0% weight.	Approved by all manufacturers of low speed crosshead diesel engines.  <b>Compatibility and Miscibility</b> Please note that due to its high additive content, it is not advisable to mix Shell Alexia 50 with any other cylinder lubricant.
<b>Shell Melina 30</b>  AUST ONLY  Multipurpose crankcase and marine lubricant	Shell Melina 30 is a premium quality marine multi-purpose system oils designed primarily for low-speed, crosshead, marine diesel engines operating on residual fuels.  However they are also suitable for use in a wide variety of engine and shipboard applications.	<ul style="list-style-type: none"><li>• Crankcase systems of low speed crosshead marine diesel engines operating on residual fuel.</li><li>• Main and auxiliary trunk piston diesel engines burning distillate fuel.</li><li>• Turbochargers, geared transmissions, oil lubricated stern tubes, variable pitch propellers.</li><li>• Deck machinery and marine ancillary equipment requiring an SAE 30 oil.</li></ul>	API CD FZG Gear Rig Test 12th load stage TBN 8
<b>Shell Melina S 30</b>  Marine diesel engine system oil	Shell Melina S 30 is a high performance multifunctional low speed diesel engine lubricant based on a blend of highly refined high viscosity index mineral oils and a balanced selection of additives.  It is designed to provide the highest levels of machinery protection in highly rated low speed marine engines, but being multifunctional, can also be used in many different items of marine equipment and used to rationalise the number of grades of lubricant carried on board ship.  Please note that Shell Melina S 30 is NOT recommended for trunk-piston engines and in these cases Shell Melina should be used.	<ul style="list-style-type: none"><li>• Low speed marine diesel engine crankcase and piston cooling systems.</li><li>• Turbochargers, geared transmissions, oil lubricated stern tubes and deck machinery.</li><li>• All ancillary equipment requiring an SAE 30 oil.</li></ul>	Shell Melina S30 is approved by all major low speed diesel engine manufacturers.
For Medium Speed Diesel Engine Oils see Stationary Generator Set, Marine Diesel Engine Oils Section (PAGE 72 – 73)			

STATIONARY GENERATOR SET, MARINE ENGINE OILS (MEDIUM SPEED)			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Argina T</b>  30 40	Shell Argina T products are a multifunctional crankcase lubricant for highly rated medium-speed diesel engines operating on residual fuel.  Shell Argina T is designed for conditions of moderate oil stress.	Medium-speed industrial or marine propulsion and auxiliary engines, burning residual fuel oils, which create conditions of moderate oil stress.  These conditions usually occur: <ul style="list-style-type: none"><li>• In engine designs more than 5 years old, or</li><li>• Where oil consumption is 1g/kWh or more, or</li><li>• In newer designs where load factors are predominantly 85% or less, or</li><li>• Where fuels with sulphur &lt;3% are in use.</li></ul> Marine engine reduction gears and certain other ship-board applications, where specialist lubricants are not required.	Shell Argina T products enjoys a comprehensive range of Original Equipment Manufacturers' approvals through field experience over many years and meets the engine test criteria for API CF.
<b>Shell Argina X 40</b>	Shell Argina X 40 is a multifunctional crankcase lubricant for highly rated medium-speed diesel engines operating on residual fuel.  Shell Argina X 40 is designed for conditions of high oil stress and has been further optimised to improve deposit control.	Medium-speed industrial or marine propulsion and auxiliary engines, burning residual fuel oils, which create conditions of high oil stress.  These conditions usually occur: <ul style="list-style-type: none"><li>• In newer engine designs, less than 10 years old and/or fitted with flame rings,</li><li>• Where oil consumption is 0.5 – 1 g/kWh</li><li>• Where load factors are &gt;85%</li><li>• Where fuels with sulphur &gt;3% are in use.</li></ul> Marine engine reduction gears (SAE 40 only) and certain other ship-board applications, where specialist lubricants are not required.	Shell Argina X 40 enjoys a comprehensive range of Original Equipment Manufacturers' approvals through field experience over many years and meets the engine test criteria for API CF.
<b>Shell Argina XL 40</b>	Shell Argina XL 40 is a multifunctional crankcase lubricant for highly rated medium-speed diesel engines operating on residual fuel.  Shell Argina XL 40 is designed for conditions of very high oil stress and has been further optimised to improve deposit control.	Medium-speed industrial or marine propulsion and auxiliary engines, burning residual fuel oils, which create conditions of very high oil stress.  These conditions usually occur: <ul style="list-style-type: none"><li>• In newer engine designs, with flame rings, especially from Wartsila,</li><li>• Where oil consumption is &lt;0.5g/kWh</li><li>• Where load factors are &gt;90%</li><li>• Where fuels with sulphur &gt;3% are in use.</li></ul>	Shell Argina XL 40 is approved by Wartsila and meets the engine test criteria for API CF.

STATIONARY GENERATOR SET, MARINE ENGINE OILS (MEDIUM SPEED) (continued)			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Gadinia AL</b>  30 – NZ ONLY 40	Shell Gadinia AL products are a premium quality marine diesel engine oil designed for use in medium speed trunk piston engines, which operate on distillate fuels.  Shell Gadinia AL products are specially designed to control oil consumption in modern engines, where liner lacquering is a potential problem.  Being multifunctional Shell Gadinia AL products can also be used for other shipboard applications such as reduction gears.	<ul style="list-style-type: none"><li>• Highly rated medium speed diesel engines operating under high load or overload conditions.</li><li>• General ship application, including gears, where specialist lubricants are not required.</li></ul>	API CF  Rolls-Royce, Bergen  Deutz AG  MAN BandVW Diesel AG  Simplex (Compact Sterntube Seals)  MAK
<b>Shell Gadinia</b>  30 40	Shell Gadinia products are premium quality multifunctional diesel engine lubricants that are specially designed for the most severe service main propulsion and auxiliary marine trunk piston engines burning distillate fuels with a sulphur content up to 1%.  They also perform satisfactorily in smaller high-speed engines of fishing fleets that operate under arduous conditions and have small sumps.	<ul style="list-style-type: none"><li>• Highly rated, medium speed, main propulsion and auxiliary trunk-piston marine diesel engines.</li><li>• Geared transmissions, turbochargers, oil filled stern tubes and variable pitchpropellers.</li><li>• Deck machinery and other marine applications requiring SAE 30 or 40 viscosity oils.</li></ul>	API CF  Shell Gadinia is approved by leading trunk piston engine manufacturers.  FZG Gear Rig Test 11th load stage.
<b>Shell Caprinus XR 40</b>	Shell Caprinus XR 40 is a premium grade, heavy-duty, engine oils, intended mainly for railroad diesel engines of North American origin, particularly those manufactured by General Electric and General Motors Electro-Motive Division (EMD).  Shell Caprinus XR 40 uses the latest, low-chlorine additive technology, which offers both environmental benefits and improved performance.  Shell Caprinus XR 40 does not contain zinc and are approved for use by GM-EMD for their engines fitted with silver piston-pin bearings and by GE for their latest locomotives.  The performance of Shell Caprinus XR 40 has been demonstrated in highly rated North American railroad operation subject to the most severe operating conditions.	<ul style="list-style-type: none"><li>• North American diesel engines subjected to the most arduous duty where 'zinc-free' oils are recommended by the engine manufacturer. Applications are primarily for railroad locomotives, however, Shell Caprinus XR 40 may also be suitable for certain engines in power generation, marine and mine-haul applications.</li><li>• Shell Caprinus XR 40 is a low chlorine formulations meeting the requirements of leading railroad operators in North America.</li></ul>	API Classification      CF EMD                      Approved "Worthy of full scale field test" (WOFT)  General Electric      Gen 4 - Long Life "tentative approval"  LMOA                    Generation 5 Detroit Diesel        Recommended for DDC Series 149 engines under severe conditions
<b>Shell Rotella DD+ 40</b>  Quality diesel engine oil for Detroit Diesel 2-stroke engines	Shell Rotella DD+ 40 is a high performance, heavy-duty engine oil designed specifically for all 2-stroke diesel engines manufactured by Detroit Diesel Corporation.	<ul style="list-style-type: none"><li>• Suitable for all Detroit Diesel 2-stroke engines, in all applications including '149' engines used in mine haul trucks.</li><li>• Certain 4-cycle engines can be used in certain 4-cycle engines in off-highway applications.</li></ul>	API Service Classification      CF-II /CF  Detroit Diesel Corporation      7SE 270 8810 (Sulphated Ash less than 0.8%) All equipment

STATIONARY GENERATOR SET, MARINE ENGINE OILS (HIGH SPEED)																			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS																
Shell Sirius 15W-40	Shell Sirius 15W-40 is high performance, multifunctional diesel engine lubricants designed for use in modern high speed (>1200 rpm) diesel engines, burning distillate fuels with a sulphur content of up to 1.0% wt.	<ul style="list-style-type: none"><li>High speed propulsion engines e.g. coastal vessels, fishing trawlers, rescue boats and lifeboats.</li><li>High speed generator engines.</li></ul>	Shell Sirius 15W-40 multigrade meets: <table><tr><td>API</td><td>CH-4</td></tr><tr><td>ACEA</td><td>E3, E5</td></tr><tr><td>Caterpillar</td><td>ECF-1</td></tr><tr><td>Cummins</td><td>CES 200-71,72,76</td></tr><tr><td>Cummins (BandC Series)</td><td>CES 200-75</td></tr><tr><td>GM Allison</td><td>G4</td></tr></table> It is also approved against: <table><tr><td>Detroit Diesel/MTU</td><td>Type I (Series 2000and 4000)</td></tr><tr><td>MAN</td><td>3275</td></tr></table>	API	CH-4	ACEA	E3, E5	Caterpillar	ECF-1	Cummins	CES 200-71,72,76	Cummins (BandC Series)	CES 200-75	GM Allison	G4	Detroit Diesel/MTU	Type I (Series 2000and 4000)	MAN	3275
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Shell Sirius X 40  AUST ONLY	Shell Sirius X 40 is a top quality lubricant, of the Super High Performance Diesel Engine Oil (SHPDO) class. It is designed for the highest output, high-speed diesel engines, burning distillate fuel and is formulated to give better engine protection and longer drain intervals than normal diesel engine oils.  Shell Sirius X 40 is especially suitable for the high power/weight power units used in fast vessels and compact generator sets.	<ul style="list-style-type: none"><li>High-speed diesel engines operating on distillate fuels.</li><li>Not suitable for North American automotive type engines, for which API CF-4 type oils are required.</li></ul>	<table><tr><td>API</td><td>CF</td></tr><tr><td>MTU</td><td>Type II High</td></tr><tr><td>Performance</td><td>Category</td></tr><tr><td>Wartsila</td><td>SACM</td></tr><tr><td>MWM Deutz</td><td>High Output</td></tr><tr><td></td><td>High Speed</td></tr><tr><td>Caterpillar 3600 Series</td><td>Meets requirements</td></tr></table>	API	CF	MTU	Type II High	Performance	Category	Wartsila	SACM	MWM Deutz	High Output		High Speed	Caterpillar 3600 Series	Meets requirements		
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STEAM TURBINES																															
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS																												
Shell Turbo Oils T  32 46 68 – AUST ONLY 100 – AUST ONLY	Shell Turbo Oils T products have long been regarded as the industry standard turbine oil.  Building on this reputation, Shell Turbo Oils T products have been developed to offer performance capable of meeting the demands of the most modern non-geared steam turbine systems and light duty gas turbines.  Shell Turbo Oils T products are formulated from high quality hydrotreated base oils and a combination of zinc-free additives that provide excellent oxidative stability, protection against rust and corrosion, low foaming and excellent demulsibility.	Shell Turbo Oils T products are suited for application in the following areas: <ul style="list-style-type: none"><li>Non-geared industrial steam turbines.</li><li>Non-geared light duty gas turbines.</li><li>Water turbine lubrication.</li><li>Compressor applications.</li><li>Numerous applications where strong control over rust and oxidation is required.</li></ul>	The performance of new Shell Turbo Oils T products meet or exceed a number of major steam and gas turbine manufacturer lubricant specifications including: <table><tr><td>General Electric</td><td>GEK 28143A, 32568F, 46506D</td></tr><tr><td>Siemens</td><td>Westinghouse 21T0591 and 55125Z3</td></tr><tr><td>DIN</td><td>51515 part 1 and 2</td></tr><tr><td>ISO</td><td>8068</td></tr><tr><td>Solar</td><td>ES 9-224U, class II</td></tr><tr><td>GEC Alstom</td><td>NBA P50001</td></tr><tr><td>JIS</td><td>K2213 Type 2</td></tr><tr><td>BS</td><td>489-1999</td></tr><tr><td>ASTM</td><td>D4304, Type I</td></tr><tr><td colspan="2">Siemens/Mannesmann Demag 800037 98</td></tr><tr><td colspan="2">Approved by OEM against:</td></tr><tr><td>Siemens</td><td>TIV 9013 04</td></tr><tr><td>Alstom</td><td>HTGD 90117</td></tr><tr><td>Man Turbo</td><td>SP 079984 D0000 E9</td></tr></table>	General Electric	GEK 28143A, 32568F, 46506D	Siemens	Westinghouse 21T0591 and 55125Z3	DIN	51515 part 1 and 2	ISO	8068	Solar	ES 9-224U, class II	GEC Alstom	NBA P50001	JIS	K2213 Type 2	BS	489-1999	ASTM	D4304, Type I	Siemens/Mannesmann Demag 800037 98		Approved by OEM against:		Siemens	TIV 9013 04	Alstom	HTGD 90117	Man Turbo	SP 079984 D0000 E9
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HYDRAULIC SYSTEMS			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
Shell Tellus Oil  22 32 46 68 100	Shell Tellus Oil(s) are premium quality, solvent refined, high viscosity index mineral oil based fluids generally acknowledged to be the ‘standard-setter’ in the field of industrial hydraulic and fluid power lubrication.	<ul style="list-style-type: none"><li>Industrial hydraulic systems.</li><li>Mobile hydraulic fluid power transmission systems.</li><li>Marine hydraulic systems.</li></ul> Can be used for most hydraulic requirements in equipment such as machine tools, forklift trucks hydraulic presses and rams, earthmoving equipment etc.  Shell Tellus Oil(s) are not suitable for equipment with silver bearing surfaces for which Shell Tellus Oils S should be used.	Shell Tellus Oil(s) have the following approvals:  CINCINNATI P-68 (ISO 32), CINCINNATI P-70 (ISO 46), CINCINNATI P-69 (ISO 68) DENISON HF-0, DENISON HF-1, DENISON HF-2 Eaton (Vickers)M-2950 S, Eaton (Vickers)I-286 S  Shell Tellus Oil(s) meet the requirements of: ISO 11158 GM LS/2 AFNOR NF-E 48-603 Bosch Rexroth Ref 17421-001 and RD 220-1/04.03 Swedish Standard SS 15 54 34 AM  <b>Compatibility and Miscibility</b> Shell Tellus Oil(s) are compatible with most pumps. However, please consult your Shell representative before using in pumps containing silver plated components.  <b>Seal and Paint Compatibility</b> Shell Tellus Oil(s) are compatible with all seal materials and paints normally specified for use with mineral oils.
Shell Tellus S  32 – AUST ONLY 46 68 100 – AUST ONLY	Shell Tellus S products are ‘top-tier’, anti-wear hydraulic oils formulated to be the ultimate ‘high reference oil’ in the hydraulics industry.  Based on advanced ‘zinc and chlorine free’ technology, Shell Tellus S products are formulated to ensure exceptional performance in hydraulic fluid power transmission systems subjected to severe duty.	Primary application in industrial, marine and mobile hydraulic and fluid power transmission systems.	Shell Tellus S products have been tested and approved to exceed the following industry requirements:  Denison HF-0. Rexroth. Vickers M-2950-S (Mobile systems). I-286-S (Industrial systems). Cincinnati Milacron P68, P69, P70.
Shell Tellus T  15 46 68 100	Premium performance, anti-wear hydraulic oils which incorporate a special viscosity index improver additive to enhance their viscosity/temperature characteristics.	Hydraulic and fluid power transmission systems subjected to wide variations in temperature or where low viscosity change with fluctuating temperature is required.  Certain critical hydraulic systems can only tolerate small variations in viscosity with fluctuating temperature if efficiency and responsiveness are to be maintained.  Hydraulic oils, such as Shell Tellus T products, which exhibit multigrade viscosity characteristics may be used to particular advantage in these circumstances.	Shell Tellus T products meet the performance requirements of ISO 11158 HV Type  <b>Compatibility and Miscibility</b> The anti-wear additive technology used in Shell Tellus T products are based upon zinc, which although ideal for most hydraulic pumps, should not be used in those of older design containing silver-plated components. Shell Tellus S should be used for these applications.  <b>Seal and Paint Compatibility</b> Shell Tellus T products are compatible with all seal materials and paints normally specified for use with mineral oils.

HYDRAULIC SYSTEMS(continued)			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Tellus TX</b> 46 68	Extra-Low-Wear Hydraulic oil for extreme temperature ranges.  Shell Tellus TX products are advanced performance, antiwear, shear stable hydraulic oils designed for applications subjected to a wide range of temperatures or where small variations in viscosity with temperature are required.  The components used in these oils include specially selected shear stable VI improvers and additive technology unique to Shell.	Hydraulic and fluid power transmissions subjected to wide variations in temperature or where very small viscosity change with fluctuating temperature is required.  Certain critical hydraulic systems can only tolerate small variations of viscosity if efficiency and responsiveness are to be maintained even in varying temperatures. Shell Tellus TX products are specially designed to meet those requirements.	Shell Tellus TX products meet or exceed the following performance requirements or standards: <ul style="list-style-type: none"><li>• Vickers pump tests (M-2952-S/I-286-S)</li><li>• Bosch Rexroth shear stability)</li><li>• Case Poclain shear stability test</li><li>• Swedish Standard 155434 AM (all grades) and AV (Tellus TX 68 only)</li><li>• ISO 11158 HV</li></ul> <b>Compatibility:</b> Shell Tellus TX products are compatible with all seal materials and paints normally specified for use with mineral oils. The antiwear additive technology used is based on zinc which, although ideal for most hydraulic pumps, should not be used in those of older design containing silver plated components. In these applications Shell Tellus S should be used.
BEARING AND CIRCULATION SYSTEMS			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Morlina Oil</b> 5 10 22 32 46 68	Shell Morlina Oil(s) are high viscosity-index, solvent refined mineral oils blended with zinc free anti-wear and other additives to provide extended performance in circulatory systems or certain hydraulic systems.	<ul style="list-style-type: none"><li>• Machine circulation systems.</li><li>• Oil lubricated plain and rolling element bearings.</li><li>• High speed spindles (ISO grades 5 and 10 Only).</li><li>• Certain low loaded enclosed gears.</li><li>• Some industrial hydraulic transmission and control systems containing steel-on-bronze and silver lubrication surfaces.</li></ul>	<b>Compatibility and Miscibility</b>  Shell Morlina Oil(s) are compatible with all normal mineral oil seal materials. This includes Nitrile and Butyl rubbers, Neoprene, Viton etc., where minimal swell and hardening are required in service.
<b>Shell Morlina Oil</b> 100 150 220 320 460 – NZ ONLY	Shell Morlina Oil(s) are premium quality mineral oils blended with carefully selected additives for use in circulation systems and certain other industrial applications which do not require oils with EP properties.	Machine circulation systems <ul style="list-style-type: none"><li>• Oil lubricated plain and rolling element bearings.</li><li>• Roll-neck bearings.</li><li>• Low or moderately loaded enclosed gears.</li></ul>	Meets Morgan Specification for Circulating oils for roll-neck bearings CL according to DIN 515172  <b>Compatibility</b> Shell Morlina Oil(s) are compatible with all seal materials and paints normally specified for use with mineral oils.

GEAR SYSTEMS			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Omala Oil</b> 68 100 150 220 320 460 680	Shell Omala Oil(s) are high quality, lead-free, extreme-pressure oils designed, primarily, for the lubrication of heavy-duty industrial gears. Their high load carrying capacity and anti-friction characteristics combine to offer superior performance in gears and other industrial applications.	Shell Omala Oil(s) are formulated using high viscosity index, solvent refined, base oils and incorporate a special sulphur-phosphorus additive to provide an extreme pressure performance which allow trouble free application in following areas: <ul style="list-style-type: none"><li>• Steel gear transmissions.</li><li>• Industrial gear drives where a full EP performance is required.</li><li>• Bearings.</li><li>• Circulating and splash lubricated systems.</li></ul> For automotive hypoid gears, the appropriate Shell Spirax should be used, as the Shell Omala Oil(s) are not designed for this purpose.	Meets the ISO 12925-1 Type CKC specification  Meets the David Brown S1.53.101 specification
<b>Shell Omala Oil HD</b> 150 – AUST ONLY 220 320 460	Shell Omala Oil HD products are an advanced synthetic heavy-duty industrial gear oil offering outstanding lubrication performance under severe operating conditions, including improved energy efficiency, long service life and high resistance to micro-pitting for optimal gear protection.	Enclosed industrial reduction gear systems operating under severe operating conditions, such as high load, very low or elevated temperatures and wide temperature variations. <ul style="list-style-type: none"><li>• Particularly recommended for certain ‘lubricated-for-life’ systems.</li><li>• Plain and rolling element bearings.</li><li>• Oil circulation systems.</li></ul>	Meets the ISO 12925-1 Type CKD specification.  Meets the ANSI/AGMA 9005-D94 specification.  Meets the US Steel 224 specification.  Fulfill the requirements of and is approved by Flender AG.  Meets the David Brown S1.53.101 specification.  <b>Compatibility and Miscibility</b> Seal and paint compatibility – Shell Omala Oil HD is compatible with all seal materials and paints normally specified for use with mineral oils.
<b>Shell Omala RL 220</b>	Shell Omala RL 220 is a high performance synthetic bearing and circulation lubricant, based on synthesized hydrocarbon fluids.  It offers outstanding lubrication performance under severe operating conditions, including improved energy efficiency and long service life.	<ul style="list-style-type: none"><li>• Moderately loaded enclosed industrial reduction gearboxes operating under arduous conditions, such as very low or elevated temperatures and wide temperature variations.</li><li>• Particularly recommended for certain ‘lubricated-for-life’ systems.</li><li>• Plain and rolling element bearings.</li><li>• Oil circulation systems.</li></ul>	Meets the ISO 12925-1 Type CKS specification.  <b>Compatibility and Miscibility</b> Shell Omala RL 220 is compatible with all seal materials and paints normally specified for use with mineral oils.



GEAR SYSTEMS (continued)			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Tivela Oil S 220</b>	Shell Tivela Oil S 220 is an advanced synthetic heavy-duty industrial gear oil formulated using specially selected polyalkylene glycol base fluids and additives.  It offers outstanding lubrication performance under severe operating conditions, including improved energy efficiency, long service life and high resistance to micro-pitting.	<ul style="list-style-type: none"><li>Enclosed industrial reduction gear systems operating under severe operating conditions, such as high load, very low or elevated temperatures and wide temperature variations.</li><li>Worm gears.</li><li>Particularly recommended for certain ‘lubricated-for-life’ systems.</li><li>Bearing and circulation systems such as calendars, where high bulk oil temperatures are found.</li><li>Plain and rolling element bearings. Shell Tivela S is not recommended for the lubrication of worm gears manufactured from aluminium containing bronze alloys.</li></ul>	Meets the David Brown Type G specification.  Fully approved by Flender AG.  <b>Compatibility and Miscibility</b> High quality epoxy paints are recommended, as polyalkylene glycols will tend to attack certain conventional paints. Shell Tivela Oil S 220 has been found to be satisfactory with nitrile and Viton seal materials, although Viton seals are preferred.
AIR COMPRESSORS			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Corena Oil AP</b>	Shell Corena Oil AP products are an advanced reciprocating air compressor lubricant and is based on specially selected synthetic ester fluids.  It incorporates the latest additive technology to provide high possible performance.	<ul style="list-style-type: none"><li>All industrial reciprocating air compressors, in particular up to and above air discharge temperatures of 220°C with continuous high delivery pressures.</li><li>Breathing air compressors – Shell Corena Oil AP products may be used in breathing air compressors, provided subsidiary clean-up apparatus is used to ensure that the air produced is fit for breathing.</li></ul>	DIN 51506 VDL ISO/DP 6521-L-DAB – medium duty ISO 6743-3:2003 DAB – severe duty EN 12021  <b>Compatibility and Miscibility</b> Seal compatibility – Shell Corena Oil AP products, in common with other ester-based lubricants, is not compatible with all seal materials, and some older compressors may need to have the seals changed before they can be run on the new grades.
<b>Shell Corena Oil AS</b>	Shell Corena Oil AS products are an advanced air compressor lubricant, capable of giving high performance in many oil-flooded air compressor of screw or vane design.  Based on selected synthetic base fluids, Shell Corena Oil AS products provide long oil life and effective lubrication in machines working in extremes of temperature and working conditions.	<ul style="list-style-type: none"><li>Rotary sliding vane and screw air compressors – Oil flooded single and two-stage compressors, in particular those operating with higher output pressures of up to 20 bar and with air discharge temperatures higher than 100°C (including intermittent operation under these conditions).</li><li>Equipment running under arduous conditions, where exceptionally high ambient temperatures are found, when the oil temperature cannot be reduced to normal levels.</li><li>ABB Turbochargers fitted to low and medium speed diesel engines used in marine and power generation applications.</li></ul>	ISSO 6743-3A-DAJ.  Shell Corena Oil AS 68 fulfils the requirements of ABB VTR 184.714 “Special low friction synthetic oil” with a maximum oil change interval of 5000 hours (HZTL 90617, list 3).  <b>Compatibility and Miscibility</b> Miscibility – Shell Corena Oil AS products are fully miscible with mineral oils, although dilution with mineral lubricants will markedly reduce its performance. Care must be taken to ensure that Shell Corena Oil AS products are not mixed with other synthetic fluids.  Seal compatibility – Shell Corena Oil AS products are compatible with all sealing materials commonly used in air compressors.

AIR COMPRESSOR (continued)			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Corena Oil P</b>	Shell Corena Oil P products are a premium quality reciprocating air compressor lubricant. It is based on a blend of specially selected base oils to provide a level of performance approaching that of synthetic oils.	<ul style="list-style-type: none"><li>Industrial reciprocating air compressors operating with air discharge temperatures of up to 220°C.</li><li>Shell Corena Oil P products may be used in breathing air compressors, provided subsidiary clean-up apparatus is used to ensure that the air produced is fit for breathing.</li><li>Shell Corena Oil P 150 is approved for use in Bauer breathing air compressors.</li></ul>	DIN 51506 VDL ISO 6743-3:2003 DAA Normal Duty  Corena P 150 is approved by Bauer and is included in the “Bauer reference oil list for breathing air compressor lubricants”.  <b>Compatibility and Miscibility</b> Seal compatibility – Shell Corena Oil P products are compatible with all sealing materials commonly used in air compressors.
<b>Shell Corena Oil S</b>	Shell Corena Oil S products are a premium quality lubricant developed for the lubrication of rotary sliding vane and screw air compressors. It is based on a blend of selected solvent refined base oils and carefully chosen additives.	<ul style="list-style-type: none"><li>Rotary sliding vane air compressors – Oil flooded or oil injected, single or two-stage compressors, operating at pressures of up to 10 bar and with air discharge temperatures of up to 100°C.</li><li>Screw air compressors – Oil flooded or oil injected, single or two-stage compressors, operating at pressures of up to 20 bar and with air discharge temperatures of up to 100°C.</li></ul>	ISO 6743-3A-DAH  <b>Compatibility and Miscibility</b> Seal compatibility – Shell Corena Oil S is compatible with all sealing materials commonly used in air compressors.
REFRIGERATION COMPRESSORS			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Clavus Oil</b>	Shell Clavus Oil(s) are high quality, hydrotreated naphthenic mineral oils without additives. Specific selection of the base oil gives a range of products specially suited for the efficient lubrication of refrigerator compressors.	<ul style="list-style-type: none"><li>Refrigerator compressors – Shell Clavus Oil(s) are designed for the lubrication of compressors with ammonia (R717) as refrigerant. It can also be used when hydrocarbons (e.g. R600a) are the refrigerant. It may be used with halogenated hydrocarbon (R12, R22) if Shell Clavus G is not available. For all refrigeration and air-conditioning applications: domestic, commercial and industrial systems with high, moderate or low evaporation temperatures.</li><li>General lubrication Apart from the application in refrigerators. Shell Clavus Oil(s) can also be used for general lubrication at low temperatures.</li></ul>	Shell Clavus Oil(s) meet the requirements of DIN 51503 KAA, KC and KE.

REFRIGERATION COMPRESSORS (continued)			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Clavus Oil AB 68</b>  Synthetic Refrigerator Compressor Lubricant	Shell Clavus Oil AB 68 is a synthetic lubricant based on alkylated benzenes.  They are particularly recommended for refrigerator compressors operating with ammonia and HCFC as refrigerant.	<ul style="list-style-type: none"><li>Refrigerator compressors —Shell Clavus AB 68 is recommended for use in open, semi-open and hermetic compressors in domestic, commercial and industrial refrigeration systems. It can be used in both screw and reciprocating compressor types. Shell Clavus AB 68 is designed for application with ammonia (R717) where it offers an excellent performance, even under high temperatures or below -33°C evaporation temperature.</li><li>Other refrigerants than ammonia – Shell Clavus AB 68 is also fully suitable for use with halogenated refrigerants (CFC, HCFC). It may also be used in systems where hydrocarbon (e.g. R600a) is the refrigerant and with the refrigerant R402A/B.</li></ul>	Shell Clavus AB 68 meets the requirements of DIN 51503, KAA and KC.
GAS COMPRESSORS			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Madrela Oil T</b>  NZ ONLY  Synthetic lubricant for gas compressors	Shell Madrela Oil T has been specially developed for compressors handling hydrocarbon and other gases.  It is based on polyalkylene glycol base fluids and is fully approved by leading gas compressor manufacturers.	Reciprocating gas compressors Sump and lubrication systems of enclosed pattern compressors handling hydrocarbon and other gases where the crankcase and bearings operate in a gas atmosphere.  Shell Madrela Oil T is suitable for compressors handling the following gases: <ul style="list-style-type: none"><li>Methane Butylene.</li><li>Ethane Butadiene.</li><li>Ethylene Vinyl chloride monomer (VCM).</li><li>Propane Propylene.</li><li>Ammonia Inert gases (dry).</li><li>Butane.</li></ul> Special changeover procedures are required when moving from mineral oil-based products to Shell Madrela Oil T and vice versa.	Shell Madrela Oil T is approved by the following manufacturers of gas cargo and general service compressors:  <b>Sulzer Burckhardt A.G.</b> – Approved for use in their K-type gas compressors for general LPG/LNG service and for ammonia, vinyl chloride monomer and butadiene.  <b>Linde A.G.</b> – Approved for general service gas compression including ammonia, vinyl chloride monomer and butadiene.

STERN TUBES			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Strombus HS</b>  AUST ONLY	Shell Strombus HS is designed specifically for stern tubes with non-circulatory oil-filled lubrication systems and is particularly recommended where oil must be prevented from leaking past damaged or worn aft seals.  The vast majority of ships today are fitted with oil lubricated stern tubes. The stern tube bearings and the tail shaft are required to operate reliably, often in extreme conditions due to vibration, water ingress, flexing of the vessel's structure, movement of the vessel in heavy seas and with variations of speed and temperature.  Shell Strombus HS is specifically designed as a stern tube lubricant for non-circulatory oil-filled systems, where face or labyrinth seals are fitted.	Stern Tubes where an emulsifying type of oil is required to prevent leakage past damaged or worn shaft seals.	Kinematic Viscosity373 cSt at 40OC
<b>Shell Strombus MP</b>  Emulsifiable stern tube oil	Shell Strombus MP is designed specifically for oil-filled stern tubes, particularly in the event of leakage. It is mainly used for the lubrication of stern tube bearings and protection of tail shafts in systems incorporating lip seal stern tube glands, but also some face seals.  The vast majority of ships today are fitted with oil lubricated stern tubes. The stern tube bearings and the tail shaft are required to operate reliably, often in extreme conditions due to vibration, water ingress, flexing of the vessel's structure, movement of the vessel in heavy seas and with variations of speed and temperature.  Shell Strombus MP is specifically designed to be compatible with Shell Strombus T and with diesel engine oils used for stern tube lubrication. It is also suitable for the lubrication of the fin shafts of certain retractable stabilisers.	Stern Tubes where an emulsifying type of oil is required to prevent leakage past damaged or worn shaft seals.	Kinematic Viscosity273 cSt at 40OC

OTHER OILS AND FLUIDS			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Calibration Fluid S9365</b>  Diesel pump and injector calibration fluid	For the testing and calibration of diesel fuel injection pumps and injectors and as a run – out fuel for diesel engines being shut down or stored for a period.  Product incorporates corrosion inhibitors which provide protection for the fuel system and is formulated to provide: <ul style="list-style-type: none"><li>• Good storage stability to avoid oxidation deposits.</li><li>• Low pour point.</li><li>• Closely controlled viscosity characteristics.</li><li>• Minimal risk of skin complaints.</li></ul>	Diesel Pumps and Injectors – Shell Calibration Fluid S9365 is a diesel injector pump test, calibration and run-out fluid for diesel pumps and injectors.	ISO 4113      Meets SAE J967D      Meets CAV specification      7-10-106 Bosch      VS 15665 OL Mercedes-Benz      Sheet 133
<b>Shell Thermia Oil B</b>	Shell Thermia Oil B is based on carefully selected highly refined mineral oils chosen for its ability to provide superior performance in indirect closed fluid heat transfer systems.	Enclosed circulated heat transfer systems for industrial applications such as process industry, chemical plants, textile producers etc. and in household equipment such as oil filled radiators. Shell Thermia Oil B can be used in high temperature continuous heat transfer equipment with the following application limits: <ul style="list-style-type: none"><li>• Max film temperature 340°C.</li><li>• Max bulk temperature 320°C.</li></ul>	Classified as ISO 6743-12 Family Q.  Meets typically DIN 51522 requirements.

2-STROKE ENGINE OILS – LEISURE MARINE			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Nautilus Premium Outboard Oil TCW 3®</b>	Shell Nautilus Premium Outboard Oil TCW 3® is a high performance lubricant for the superior protection of all 2-stroke gasoline outboard motors. Its advanced formulation, which exceeds all outboard motor manufacturers’ standards, is formulated to deliver long and reliable engine life.	All two-stroke gasoline outboard motors with or without separate oil tanks.	Shell Nautilus Premium Outboard Oil TCW 3® exceeds the requirements of all major outboard motor manufacturers and all industry specifications.  Certified by NMMA (National Maritime Manufacturers’ Association) for service TC-W3 at the manufacturer’s recommended fuel/oil ratio (up to 100:1).
4-STROKE ENGINE OILS – LEISURE MARINE			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Nautilus Premium 4-Stroke Oil</b>  Synthetic technology premium 4-stroke petrol/diesel engine oil	Shell Nautilus Premium 4-Stroke Oil is formulated with high quality base oils and synthetic, performance enhancing additives, giving excellent performance in both petrol and diesel engines used in marine application (inboard and outboard).	<ul style="list-style-type: none"><li>• Provides premium protection for 4-stroke outboard engines as well as 4 stroke petrol and diesel marine inboard engines.</li><li>• Suitable for petrol engines running on leaded and unleaded fuel and for all 4-stroke high speed marine diesel engines (but not Detroit) including turbo charged units.</li></ul>	Suitable for use where the following specifications are called for:  API service classification      SL/CF
MARINE SPECIALITIES – LEISURE MARINE			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>Shell Nautilus Premium Marine Gear 80W-90</b>  Marine gear oil for manual shift	Shell Nautilus Marine Gear 80W-90 is a high quality, extreme pressure lubricant for the protection of marine transmission systems.	Recommended for inboard and outboard gear cases.  Meets API GL-5 performance and can be used where Type C gears are recommended.  Formulated to provide the necessary protection for all gear cases including Mercury, Honda, OMC and Yamaha.	Nautilus Nautilus Marine Gear 80W-90 satisfies the requirements of major manufacturers specifying an extreme pressure gear oil.  It exceeds the following industry standards:  API      GL-5
<b>Shell Nautilus Marine Grease</b>  Water resistant grease for boats and trailers	Shell Nautilus Marine Grease is a mixed soap (lithium/calcium) grease, developed to provide excellent water compatibility, for marine and trailer applications.	Specially formulated multi-purpose marine grease.  Ideally suited for universal use on boats and trailers.  Recommended for: <ul style="list-style-type: none"><li>• All grease points on boasts including inboard and outboard engines.</li><li>• Wheel bearings and rollers on boat trailers.</li></ul>	NLGI Classification      2  Warning: Mixing of greases with different bases can result in softening and leakage.

LUBRICANTS CONDITION MONITORING SERVICE – LUBEANALYST  
(FORMERLY SHELL CARE)

LUBEANALYST AUSTRALIA			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>LubeAnalyst Standard</b>  PACK: 10 SAMPLES PER KIT  Shell's standard oil analysis package	LubeAnalyst Standard is suited to medium criticality machinery.  It provides information for the detection and trending of lubricant degradation and contamination.  For wear debris analysis this level of analysis trends wear and identifies when a machine has strayed from its normal wear behaviour.	Oil analysis for the detection and trending of lubricant degradation, contamination and wear	<ul style="list-style-type: none"><li>• Viscosity (ASTM D445) at 40°C for industrial oils. 100°C for engine oils.</li><li>• Spectrographic Analysis (ASTM D5185)</li><li>• FTIR – Tests for water and glycol content, fuel dilution, oxidation and nitration and soot index</li><li>• Fuel Dilution (ASTM D3828) – for engine oils</li><li>• Dispersency (Shell Method Blotter Spot)</li><li>• Appearance</li><li>• Base Number (ASTM D2896) (Only tested for diesel and natural gas engines)</li><li>• Acid Number (ASTM D974) (Only tested for refrigeration compressors)</li></ul>
<b>LubeAnalyst Advanced 1</b>  Advanced oil analysis service with more detailed wear analysis than LubeAnalyst Standard	LubeAnalyst Advanced 1 is suited to medium criticality machinery.  It provides information for the detection and trending of lubricant degradation and contamination.  For wear debris analysis this service level trends wear and identifies when a machine has strayed from its normal wear behaviour.  This analysis level also identifies the presence of abnormal ferrous wear debris, which is important for gearboxes, and transmissions for the detection of fatigue related wear.	Oil analysis for the detection and trending of lubricant degradation, contamination and wear	<ul style="list-style-type: none"><li>• Viscosity (ASTM D445) at 40°C for industrial oils. 100°C for engine oils.</li><li>• Spectrographic Analysis (ASTM D5185)</li><li>• FTIR – Tests for water and glycol content, fuel dilution, oxidation and nitration and soot index.</li><li>• Fuel Dilution (ASTM D3828) – for engine oils.</li><li>• Dispersency (Shell Method Blotter Spot)</li><li>• Appearance</li><li>• Base Number (ASTM D2896) (Only tested for diesel and natural gas engines)</li><li>• Acid Number (ASTM D974) (Only tested for refrigeration compressors)</li><li>• PQ Index</li></ul>
<b>LubeAnalyst Advanced 2</b>  Advanced oil analysis service with more detailed wear analysis than Shell Care Advanced 1	LubeAnalyst Advanced 2 is suited to medium to high criticality machinery.  It provides adequate information for the detection and trending of lubricant degradation and contamination.  For wear debris analysis this level of analysis trends wear and identifies when a machine has strayed from its normal wear behaviour.  This analysis level also identifies the presence of abnormal ferrous wear debris.  For qualifying samples this analysis level also identifies the presence and morphological nature of relatively large ferrous and non-ferrous wear debris.	Oil analysis for the detection and trending of lubricant degradation, contamination and wear	<ul style="list-style-type: none"><li>• Viscosity (ASTM D445) at 40°C for industrial oils. 100°C for engine oils.</li><li>• Spectrographic Analysis (ASTM D5185)</li><li>• FTIR – Tests for water and glycol content, fuel dilution, oxidation and nitration and soot index.</li><li>• Fuel Dilution (ASTM D3828) – for engine oils.</li><li>• Dispersency (Shell Method Blotter Spot)</li><li>• Appearance</li><li>• Base Number (ASTM D2896) (Only tested for diesel and natural gas engines)</li><li>• Acid Number (ASTM D974) (Only tested for refrigeration compressors)</li><li>• PQ Index Filtergram by Monash University Method (for qualifying samples only)</li></ul>
Note: All samples submitted to Shell are tested according to their source. For example, engine oil being utilised in a hydraulic system is tested as a hydraulic fluid, not engine oil.			

LUBRICANTS CONDITION MONITORING SERVICE – LUBEANALYST  
(FORMERLY SHELL CARE)

LUBEANALYST AUSTRALIA (continued)			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>LubeAnalyst Premium 1</b>  Shell's premium oil analysis service with detailed wear analysis and particle size distribution monitoring for complete care of your lubricants and machinery	LubeAnalyst Premium 1 is suited to high criticality machinery.  It provides information for the detection and trending of lubricant degradation and contamination.  For wear debris analysis this level of detection will also trend wear levels and identify when a machine has strayed from normal wear behaviour.  This analysis level identifies the presence of relatively large ferrous wear debris.  Finally, this analysis level includes Particle Size Distribution for monitoring contamination levels in accordance with NAS or ISO classifications.	Oil analysis for the detection and trending of lubricant degradation, contamination and wear	<ul style="list-style-type: none"><li>• Viscosity (ASTM D445) at 40°C for industrial oils. 100°C for engine oils.</li><li>• Spectrographic Analysis (ASTM D5185)</li><li>• FTIR – Tests for water and glycol content, fuel dilution, oxidation and nitration and soot index.</li><li>• Fuel Dilution (ASTM D3828) – for engine oils.</li><li>• Dispersency (Shell Method Blotter Spot)</li><li>• Appearance</li><li>• Base Number (ASTM D2896) (Only tested for diesel and natural gas engines)</li><li>• Acid Number (ASTM D974) (Only tested for refrigeration compressors)</li><li>• PQ Index</li><li>• Particle Size Distribution (Particle Counting) – ISO 4406.</li></ul>
<b>LubeAnalyst Premium 2</b>  The ultimate Shell oil analysis service providing the most detailed and advanced analysis of your lubricants and machinery	LubeAnalyst Premium 2 is generally suited to high criticality machines and machine elements.  It provides information for the detection and trending of lubricant degradation and contamination.  For wear debris analysis this level of detection will also trend wear levels and identify when a machine has strayed from normal wear behaviour.  This analysis level identifies the presence of relatively large ferrous wear debris and also includes Particle Size Distribution for monitoring contamination levels in accordance with ISO 4406.  For qualifying samples this analysis level also identifies the presence and morphological nature of relatively large ferrous and non-ferrous wear debris.	Oil analysis for the detection and trending of lubricant degradation, contamination and wear	<ul style="list-style-type: none"><li>• Viscosity (ASTM D445) at 40°C for industrial oils. 100°C for engine oils.</li><li>• Spectrographic Analysis (ASTM D5185)</li><li>• FTIR - Tests for water and glycol content, fuel dilution, oxidation and nitration and soot index.</li><li>• Fuel Dilution (ASTM D3828) – for engine oils.</li><li>• Dispersency (Shell Method Blotter Spot)</li><li>• Appearance</li><li>• Base Number (ASTM D2896) (Only tested for diesel and natural gas engines)</li><li>• Acid Number (ASTM D974) (Only tested for refrigeration compressors)</li><li>• PQ Index</li><li>• Particle Size Distribution (Particle Counting) – ISO 4406.</li><li>• Filtergram by Monash University Method (for qualifying samples only)</li></ul>
<b>LubeAnalyst Particle Size Distribution</b>	LubeAnalyst Particle Size Distribution monitors lubricant contamination levels for equipment where controlling contamination is critical. LubeAnalyst Particle Size Distribution can be used to assess contamination rates and to monitor the success of ‘clean’ oil handling procedures and the effectiveness of filtration systems.	Particle counting for the purpose of lubricant cleanliness monitoring	Particle Size Distribution (Particle Counting) – ISO 4406.
Note: All samples submitted to Shell are tested according to their source. For example, engine oil being utilised in a hydraulic system is tested as a hydraulic fluid, not engine oil.			



LUBEANALYST AUSTRALIA (continued)			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>LubeAnalyst Filtergram</b>	<p>LubeAnalyst Filtergram involves the morphological study of wear debris and contaminants with the aid of a microscope and digital camera.</p> <p>Wear particles and contaminants are then categorised according to their type, size range and severity.</p> <p>LubeAnalystFiltergram analysis is particularly useful for identifying fatigue wear and cutting wear which have very distinctive shapes and surface textures and can therefore be positively identified.</p>	LubeAnalyst Filtergram analysis for the identification of wear modes and contamination types	LubeAnalyst Filtergram by Monash University Method
<b>LubeAnalyst Engine Coolant</b>	<p>LubeAnalyst Engine Coolant monitors coolant and equipment condition based on laboratory coolant analysis.</p> <p>The service is suited to glycol-based coolants operating in petrol, LPG, natural gas, biogas and diesel fuelled engines and in industrial cooling systems.</p> <p>The primary purpose of LubeAnalyst Engine Coolant testing is to analyse coolant fluids to determine suitability for continued use. This includes the coolants’ ability to continue to provide the required performance with respect to cooling, anti-freeze performance and very importantly, protection from corrosion and cavitation related wear.</p> <p>LubeAnalyst Engine Coolant also analyses contaminants and wear metal particles present in the coolant, in order to trend the rate of wear and contamination.</p>	LubeAnalyst Engine Coolant condition monitoring for pro-active maintenance programs	<ul style="list-style-type: none"><li>• pH (APHA 4500)</li><li>• Spectrographic Analysis (APHA 3120)</li><li>• PQ Index</li><li>• Reserve Alkalinity (ASTM D1121) – Reserve alkalinity is related to water: glycol ratio and pH</li><li>• Glycol Content</li><li>• Freeze Point</li><li>• Conductivity (AHPA 2510) – Conductivity is relates to concentration of inhibitor, hard water contaminations, etc.</li><li>• Nitrite and Molybdate Levels</li><li>• Appearance and Odour</li></ul>
<p>Note: All samples submitted to Shell are tested according to their source. For example, engine oil being utilised in a hydraulic system is tested as a hydraulic fluid, not engine oil.</p>			

LUBEANALYST AUSTRALIA (continued)			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>LubeAnalyst Turbine</b>	<p>Specialised Turbine Oil testing to supplement routine LubeAnalyst packages</p> <p>For turbines, a tailored oil analysis program is required to monitor the behaviour and condition of the turbine and the condition of the lubricant that could be in service for up to 20 years.</p> <p>LubeAnalyst Turbine oils are formulated with a number of properties that are key to the continuing operation of the turbine – properties such as [1] the ability to separate water and/or steam rapidly, [2] resisting oxidation, [3] resisting the formation of sludges and gums, and [4] the capability to protect components from rust or corrosion.</p> <p>There are three turbine analysis levels: Standard, Advanced and Premium.</p> <p>Standard – For regular condition monitoring purposes. Usually recommended on a monthly basis for gas turbines and on a quarterly basis for steam turbines;</p> <p>Advanced – Introduces RPVOT and is recommended on a quarterly for gas turbines and on a bi-annual basis for steam turbines;</p> <p>Premium – Highly comprehensive and need only be completed on an annual basis for specific trouble shooting purposes or for benchmarking purposes with new clients that are implementing a LubeAnalyst Specialist Turbine programme.</p>	Specialised oil condition monitoring for gas, steam, hydro turbines, axial and centrifugal compressors and turbine generators.	<p><b>Standard</b></p> <p>Recommended for gas and steam turbines:</p> <ul style="list-style-type: none"><li>• Viscosity (ASTM D445)</li><li>• Water by Karl Fischer Test (ISO 760)</li><li>• Spectrographic Analysis (ASTM D5185)</li><li>• FTIR for nitration, oxidation</li><li>• Acid Number (ASTM D974)</li><li>• Particle Size Distribution (ISO 4406)</li><li>• Filtergram (Monash University Method)</li></ul> <p><b>Advanced</b></p> <p>Recommended for gas and steam turbines. As for Standard above but includes:</p> <ul style="list-style-type: none"><li>• Rotating Pressure Vessel Oxidation Test RPVOT (ASTM D2272).</li></ul> <p><b>Premium</b></p> <p>Recommended for gas and steam turbines. As for Advanced above but includes:</p> <ul style="list-style-type: none"><li>• Air Release via IP 313 – This test is to check that entrained air is released from the oil while resident in the system reservoir.</li><li>• Foaming Tendency via ASTM D 892, Sequence I</li><li>• Millipore Sludge via Shell developed method.</li></ul> <p>Recommended for steam turbines only. These tests are not required for gas turbines. Add these tests to the other Premium tests listed above.</p> <ul style="list-style-type: none"><li>• Rust Test via ASTM D 665B</li><li>• Water Separation via IP 19</li></ul>
LUBEANALYST NEW ZEALAND			
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS
<b>LubeAnalyst New Zealand</b>	<p>Shell New Zealand standard oil analysis package</p> <p>Oil analysis for the detection and trending of lubricant degradation, contamination and wear</p> <p>LubeAnalyst New Zealand provides information for the detection and trending of lubricant degradation and contamination.</p> <p>For wear debris analysis this level of analysis trends wear and identifies when a machine has strayed from its normal wear behaviour.</p>	Shell New Zealand standard oil analysis package.	<ul style="list-style-type: none"><li>• Kinematic Viscosity (ASTM D445). Measured at 40°C for industrial oils and 100°C for engine oils.</li><li>• FTIR - Tests for water content, oxidation and nitration and soot.</li><li>• Fuel Dilution (ASTM D3828)</li><li>• Wear Metals (XRF)</li><li>• Base Number (ASTM D2896) (Only tested for diesel and natural gas engines)</li><li>• Acid Number (ASTM D974) (Only tested for hydraulic systems, gearboxes and refrigeration compressors).</li><li>• Colour (Only tested for gas engines, hydraulic systems, gearboxes and refrigeration compressors)</li><li>• Chlorine (XRF) (Only tested for land fill gas engines only)</li><li>• Water (Karl Fischer) (Only tested with this method for hydraulic systems and refrigeration compressors)</li></ul>
<p>Note: All samples submitted to Shell are tested according to their source. For example, engine oil being utilised in a hydraulic system is tested as a hydraulic fluid, not engine oil.</p>			

SHELL PREMIUM FLOOR SWEEP				
PRODUCT	DESCRIPTION	MAIN APPLICATIONS	TECHNICAL SPECIFICATIONS	
<b>Shell Premium Floor Sweep</b>  Sorbent for hydrocarbon based liquid spills on hard surfaces	Shell Premium Floor Sweep is an oil and fuels sorbent that uses capillary absorbent technology, designed for industrial, commercial and automotive markets.	Shell Premium Floor Sweep is an oil and fuels sorbent that uses capillary absorbent technology, designed for industrial, commercial and automotive markets.	Appearance	Brown, fibrous, odourless powder
	Shell Premium Floor Sweep is manufactured from recycled natural waste products and encapsulates and immobilises spills so that surfaces are left dry and clean.		Bulk Density	0.364 g/Litre
			Auto Ignition Temp.	>260°C
			pH in water	4 – 5
			Absorbance	Absorbs up to 3 times its own weight in engine oil (USAP 9095 and ASTM F726-81)
Hard surfaces such as work shop floors and public roads will be left dry, and free of oil slick, after the correct application of Shell Premium Floor Sweep.		Pressure Release	345kPa min, when loaded with 70% engine oil	
Once oil has been encapsulated, the sorbent will resist oil release, even when subjected to pressure or water washing.		WARNING Strong oxidizers will react adversely with cellulose. Thus all Enretech sorbents are not suitable for the clean up of spills involving oxidizers of class II or greater.		
Shell Premium Floor Sweep can be disposed of in most States by solid waste landfill (Class I or II), incineration or commercial composting.				

SIMPLE TO USE STEP 1



Spread only enough Shell Premium Floor Sweep to cover the spill.

STEP 2



Sweep back and forth with a stiff broom until liquid is fully absorbed and floor is clean of any residue.

STEP 3



Pick up used Sorbent with dustpan. Dispose of all used Sorbent materials in accordance with local regulations.

PETROL LPG AND 4WD ENGINE OILS						
PRODUCT NAME	DENSITY AT 15OC kg/L	FLASH POINT OPEN OC	POUR POINT OC	VISCOSITY AT 40OC CST	VISCOSITY AT 100OC CST	VISCOSITY INDEX
Shell Helix Ultra VX 5W-30	0.848	192	-39	70.5	11.7	160
Shell Helix Ultra 5W-40	0.855	200	-42	83.5	13.3	161
Shell Helix Ultra 15W-50	0.88	226	-30	123	18.7	170
Shell Helix Ultra Racing 10W-60	0.851	210	-51	141	22	184
Shell Helix Ultra Extra 5W-30	0.847	230	-39	67.1	12	178
Shell Helix Plus LB 10W-30	0.88	206	-33	61	10.9	144
Shell Helix Plus Eco 10W-30	0.88	206	-30	61	9.8	145
Shell Helix Plus 10W-40	0.869	208	-33	95	14.4	157
Shell Helix Plus 15W-50	0.88	200	-30	140	18.8	148
Shell Helix Super 10W-30	0.862	226	-35	60.5	10.5	161
Shell Helix Super 15W-40	0.88	220	-30	105	14.5	132
Shell Helix Super 20W-50	0.888	205	-24	160	19.0	137
Shell Helix Red (Multi) 20W-50	0.884	221	-27	159	18.5	137
Shell Helix 20W-50	0.891	205	-24	157	18.8	137
Shell Helix Diesel Super 15W-40	0.881	224	-33	101	14	132
Shell Helix Super LPG 15W-40	0.885	235	-27	114.3	14.9	135
Shell Helix Super Older Engines 25W-60	0.89	210	-12	270	25	116
Shell Helix F 5W-30	0.857	192	-45	57.4	9.5	150
DIESEL ENGINE OILS						
PRODUCT NAME	DENSITY AT 15OC kg/L	FLASH POINT OPEN OC	POUR POINT OC	VISCOSITY AT 40OC CST	VISCOSITY AT 100OC CST	TBN-E MgKOH/g
Shell Rimula Ultra XT 5W-40	0.888	193	-33	84.4	14.8	11.1
Shell Rimula Ultra 10W-40	0.858	220	-39	91	14.6	15.5
Shell Rimula D Extra 15W-40	0.887	226	-30	110	14.7	8.2
Shell Rimula Super 15W-40	0.887	230	-36	105	15.0	10
Shell Rimula X 15W-40	0.888	233	-33	115.4	14.3	11.4
Shell Rimula M 15W-40	0.890	200	-27	104.3	14.2	7
Shell Rimula X 30	0.878	242	-18	93	11	10
Shell Rimula X 40	0.899	250	-15	135	14.6	10
Shell Rimula D 15W-40	0.89	199	-27	100.1	14.5	6.1
Shell Rotella DD40+	0.899	250	-15	138	14.4	—
Shell Rotella DD50+	0.900	250	-9	212	19	—
Shell S 7294 Oil	—	—	-18	103	11.6	10
Shell Rimula MV 15W-40	0.883	200	-30	107	14.4	9.5
Shell Harvella T 15W-40	0.89	226	-27	112	14.5	10

TRANSMISSION FLUIDS						
PRODUCT NAME	DENSITY AT 15OC kg/L	FLASH POINT OPEN OC	POUR POINT OC	VISCOSITY AT 40OC CST	VISCOSITY AT 100OC CST	VISCOSITY INDEX
Shell Helix ATF IID	0.870	193	-36	33.5	6.9	169
Shell Helix ATF XTR	0.848	190	-39	37.5	7.1	170
Shell Donax TX	0.847	152	-48	33.2	7.2	189
Shell ATF IIIG	0.864	180	-48	33.8	7.3	175
Shell ATF IID	0.864	180	-48	33.5	6.9	167
Shell ATF XTR	0.848	190	-39	37.5	7.1	170
Shell Donax TF	0.872	180	-42	39.9	8.4	180
Shell Donax TM	0.880	199	-42	40	7.5	157
Shell Transmission Fluid TDX	0.890	—	—	60.9	9.5	140
AUTOMOTIVE GEAR OILS						
PRODUCT NAME	DENSITY AT 15OC kg/L	FLASH POINT OPEN OC	POUR POINT OC	VISCOSITY AT 40OC CST	VISCOSITY AT 100OC CST	VISCOSITY INDEX
Shell Helix Synthetic Gear 75W-90	0.853	210	-42	102	15.1	150
Shell Helix Gear Oil 80W	0.885	210	-33	78	9.5	100
Shell Helix LSD 90	0.915	216	-12	216	18.6	96
Shell Helix Diff Oil 80W-90	0.897	205	-30	135	15.2	103
Shell XGO 75W-90	0.853	210	-42	102	15.1	150
Shell Spirax GX 80W	0.885	210	-33	78	9.5	—
Shell Spirax GX 80W-90	0.895	212	-30	160.5	16.1	—
Shell Spirax AX 90 LS	0.915	216	-12	216	18.6	96
Shell Spirax A 90 LS	0.909	210	-27	185	16.6	101
Shell Transaxle 75W-90	0.879	205	-45	81	14.9	194
Shell Transmission MA 75W-90	0.847	215	-42	96	14.6	158
Shell Spirax S 75W-90	0.891	207	-45	126	17.5	151
Shell Spirax S 80W-140	0.902	201	-40	271	30.5	152
Shell Spirax GSX 50	0.907	225	-39	135	18.0	151
Shell Spirax MT 80W-90	0.900	205	-27	154	15.8	104
Shell Spirax ASX 75W-140	0.869	210	-45	172.4	24.5	174
Shell Spirax AX 80W-90	0.900	223	-30	169	16.8	—
Shell Spirax AX 85W-140	0.910	225	-15	435	29.6	—
Shell Spirax A 80W-90	0.900	175	-27	151	15.3	102
Shell Spirax A 85W-140	0.908	215	-15	350	26	98
Shell Dentax 90	0.895	258	-9	183	17.0	97
Shell Donax TD 5W-30	0.882	202	-39	55.4	9.7	156
Shell Donax TD 10W-30	0.884	220	-42	70.4	11.4	151
Shell Donax TC 10W	0.883	205	-36	36	6	—
Shell Tegula V32	0.870	211	-30	32	5.6	110
Shell Rimula X 10W	0.885	219	-33	43	7	122
Shell Donax TC 30	0.899	210	-30	94	10.8	—
Shell Donax TC 50	0.91	230	-18	217	19	—
Shell Donax TC 60	0.912	230	-6	296	23.4	—
Shell Donax CFD 60	—	260	-15	—	24	—

AUTOMOTIVE POWER STEERING						
PRODUCT NAME	DENSITY AT 15OC kg/L	FLASH POINT OPEN OC	POUR POINT OC	VISCOSITY AT 40OC CST	VISCOSITY AT 100OC CST	VISCOSITY INDEX
Shell Helix Power Steering	0.870	194	-42	34.6	7	169
MOTORCYCLE LUBRICANTS						
PRODUCT NAME	DENSITY AT 15OC kg/L	FLASH POINT OPEN OC	POUR POINT OC	VISCOSITY AT 40OC CST	VISCOSITY AT 100OC CST	VISCOSITY INDEX
Shell Advance Racing X 2	0.93	90	-15	—	20	—
Shell Advance VSX2	0.885	83	-21	35.6	6.80	130
Shell Advance SX2	0.871	105	-12	14	7.1	116
Shell 2T Max	0.884	82	-51	42	8.6	—
Shell Advance Quad 10W-40	0.875	205	-36	91	14.4	164
Shell Advance HD 50	0.895	>205	-15	225	20	100
Shell Advance Ultra 4 10W-40	0.851	202	-36	98.6	14.3	186
Shell Advance VSX4 15W-50	0.87	209	-27	140	19.2	155
Shell Advance SX4 15W-50	0.896	>205	-27	161	19.9	144
Shell Advance S4 20W-50 SG/MA	0.894	250	-18	181	20.5	132
Shell Advance Racing M	0.950	>205	-18	115	12.2	95
Shell Advance Gear 10W-40	0.887	218	-36	101	14	147
Shell Advance Shaft	0.899	205	-27	135	14.6	103
Shell Advance Silicone Brake	0.96	206	—	—	14	—
Shell Advance Ultra Suspension Fluid 2.5	0.83	—	—	8.6	3.6	410
Shell Advance Ultra Suspension Fluid 5	0.845	164	—	23.5	5.9	230
Shell Advance Fork 5	0.834	145	<-51	21	5	167
Shell Advance Fork 10	0.84	195	-42	32	6.4	153
Shell Advance Fork 15	0.85	200	-39	46	8.2	154
Shell Advance Fork 20	0.86	220	-27	59	9.3	137
Shell Advance Filter	0.89	267	—	485	14.0	103
Shell Advance Filter Oil Spray	0.73	<0	—	—	—	—
Shell Advance Chain Ultra	0.783	-60	—	—	—	—
Shell Advance Chain	0.90	—	—	3000	9.3	—
Shell Advance Helmet and Visor	—	<0	—	—	—	—
Shell Advance Silicone Spray	0.63	-60	—	—	—	—
Shell Advance Bike Cleaner	0.995	—	—	—	—	—

INDUSTRIAL PRODUCTS						
PRODUCT NAME	DENSITY AT 15OC kg/L	FLASH POINT OPEN OC	POUR POINT OC	VISCOSITY AT 40OC CST	VISCOSITY AT 100OC CST	VISCOSITY INDEX
Shell Corena Oil AP 68	0.990	250	-51	68	8.5	—
Shell Corena Oil AP 100	0.988	260	-39	100	10.2	—
Shell Corena Oil AS 46	0.854	235	-33	46	8	—
Shell Corena Oil AS 68	0.859	240	-33	68	11	—
Shell Corena Oil P 68	0.883	235	-20	68	7.8	—
Shell Corena Oil P 100	0.899	240	-20	100	9.2	—
Shell Corena Oil P 150	0.902	240	-20	155	12.1	—
Shell Corena Oil S 46	0.874	210	-30	46	6.7	—
Shell Corena Oil S 68	0.876	215	-30	68	9	—
Shell Corena CH 46	0.875	—	-24	46	—	—
Shell Corena NG 220	0.888	268	-24	211	17.9	92
Shell Omala Oil RL 220	0.853	240	-48	220	26	-
Shell Omala Oil RL 460	0.855	274	-42	460	45.5	155
Shell Vitrea Oil 46	0.873	228	-12	46	6.8	100
Shell Vitrea Oil 68	0.881	223	-12	68	8.8	95
Shell Vitrea Oil 22	0.866	204	-18	22	4.2	80
Shell Vitrea Oil M 680	0.910	270	-6	680	37	80
Shell Delima 150	0.9	260	-9	150	14.6	96
Shell Delima S 150	0.890	210	-24	150	14.8	98
Shell Delima S 220	0.897	210	-18	220	19.2	98
Shell Morlina Oil 10	0.881	150	-33	10	—	—
Shell Morlina Oil 150	0.887	262	-15	150	15	—
Shell Morlina Oil 220	0.891	280	-15	220	18.3	—
Shell Morlina Oil 320	0.897	282	-12	320	25	—
Shell Morlina Oil 460	0.904	300	-9	460	30	—
Shell Diala Oil B	0.881	140	-57	10.7	—	—
Shell Diala Oil BX	0.881	140	-57	10.7	—	—
Shell Diala Concentrate P	0.888	140	-10	11	—	—
Shell Mysella R 40	0.899	230	-18	139	14.2	100
Shell Mysella LA 40	0.892	230	-18	139	14	98
Shell Mysella MA 40	0.894	230	-18	139	14	—
Shell Mysella XL 40	0.89	>180	-18	128	14	BN – 4.5
Shell Thermia Oil B	0.868	230	-12	25	4.7	—
Shell Thermia Oil D	0.885	270	-9	97	10.9	—
Shell Tellus Oil 22	0.866	204	-30	22	4.3	—

INDUSTRIAL PRODUCTS (continued)						
PRODUCT NAME	DENSITY AT 15OC kg/L	FLASH POINT OPEN OC	POUR POINT OC	VISCOSITY AT 40OC CST	VISCOSITY AT 100OC CST	VISCOSITY INDEX
Shell Tellus Oil 32	0.875	209	-30	32	5.4	—
Shell Tellus Oil 46	0.879	218	-30	46	6.7	—
Shell Tellus Oil 68	0.886	223	-24	68	8.6	—
Shell Tellus Oil 100	0.891	234	-24	100	11.1	—
Shell Tellus Oil S 32	0.872	207	-30	32	5.4	—
Shell Tellus Oil S 46	0.876	218	-30	46	6.8	—
Shell Tellus Oil S 68	0.883	222	-30	68	8.7	—
Shell Tellus Oil S 100	0.890	234	-24	100	11.2	—
Shell Tellus Oil T 15	0.871	160	-42	15	3.8	—
Shell Tellus Oil T 37	0.871	220	-39	37	6.9	150
Shell Tellus Oil T 46	0.872	210	-39	46	8.2	—
Shell Tellus Oil T 68	0.877	230	-36	68	10.9	—
Shell Tellus Oil T 100	0.889	176	-30	100	14.7	—
Shell Tellus Arctic 32	0.886	>100	-60	33.6	9.89	300
Shell Naturelle HF-E	0.919	219	-51	46.1	9.1	182
Shell Irus Fluid DR	1.125	245	-18	43	5.3	15
Shell Irus Fluid C (2005)	1.059	—	-18	47	—	—
Shell Irus DU 68	0.922	—	-24	64	12	190
Shell Omala Oil 68	0.887	190	-24	68	8.7	—
Shell Omala Oil 100	0.891	195	-24	100	11.4	—
Shell Omala Oil 150	0.897	195	-24	150	15	—
Shell Omala Oil 220	0.899	200	-18	220	19.4	—
Shell Omala Oil 320	0.903	205	-15	320	25	—
Shell Omala Oil 460	0.904	205	-12	460	30.8	—
Shell Omala Oil 680	0.913	205	-9	680	38	—
Shell Omala Oil 800	0.93	215	—	800	39	—
Shell Omala Oil HD 150	0.849	235	-54	150	19.7	149
Shell Omala Oil HD 220	0.853	240	-48	220	25.8	148
Shell Omala Oil HD 320	0.855	245	-45	320	33.4	145
Shell Omala Oil HD 460	0.857	245	-42	460	45.5	155
Shell Omala Oil F 320	0.903	202	-15	320	25	100
Shell Omala Oil F 460	0.904	204	-9	460	30.8	97
Shell Omala Oil JM	0.907	232	-21	486	33.5	102
Naturelle Gear Oil EP 320	0.951	>220	-39	320	35	150
Shell Tivela Oil S 150	1.076	302	-42	136	22.5	188



INDUSTRIAL PRODUCTS (continued)						
PRODUCT NAME	DENSITY AT 150C kg/L	FLASH POINT OPEN OC	POUR POINT OC	VISCOSITY AT 400C CST	VISCOSITY AT 1000C CST	VISCOSITY INDEX
Shell Tivela Oil S 220	1.074	298	-39	220	34.4	203
Shell Tivela Oil S 320	1.069	286	-39	320	52.7	230
Shell Tivela Oil GL 00	1.009	—	—	142	23	—
Shell Argina T 30	0.918	212	-18	110	12	30
Shell Argina T 40	0.921	225	-18	135	14	30
Shell Gadinia 30	0.897	200	-18	104	11.8	—
Shell Gadinia 40	0.900	225	-18	139	14.4	—
Shell Caprinus XR 40	0.908	260	-9	150	15.1	98
Shell Caprinus XR 20W-40	0.92	256	-9	132	15.1	115
Shell Clavus Oil 15	0.886	170	-48	15	3.1	—
Shell Clavus Oil 46	0.900	189	-39	46	5.6	—
Shell Clavus Oil 68	0.900	193	-33	68	7	—
Shell Clavus Oil G 32	0.896	195	-48	32	4.6	47
Shell Clavus Oil G 68	0.906	220	-39	68	6.9	45
Shell Clavus Oil G 46	0.902	210	-42	46	5.6	—
Shell Clavus Oil SP 68	0.838	240	-54	65	9.6	137
Shell Clavus Oil SD 22-12	0.878	185	-45	38	4.9	—
Shell Clavus Oil AB 68	0.871	190	-42	68	6	—
Shell Madrela Oil T	1.056	262	-30	190	36	—
Shell Tonna Oil S 68	0.879	225	-15	68	8.6	105
Shell Tonna Oil S 220	0.894	250	-12	220	19.4	98
Shell Oven Chain Lubricant	1.1	—	—	—	—	—
Shell Sugar Mill Clear	0.961	220	-3	6242	—	—
Shell Sugar Mill Oil	1.00	250	6	13500	325	140
Shell Malleus JBZ	0.900	>140	—	—	—	—
Shell Dobatex Platinum	1.02	—	—	—	—	—
Shell Dobatex Gold	1.10	—	—	—	—	—
Shell Dobatex Truck Wash	1.10	—	—	—	—	—
Shell Dobatex Aqua Degreaser	1.00	70	—	—	—	—
Shell Degreasing Fluid	0.810	80	—	<7	—	—
Shell Degreasing Fluid QB	0.79	64	—	1.7	—	—
Shell Hand Cleaner	—	—	—	—	—	—
Shell Moulding Oil O5	0.84	—	—	4	—	—
Shell Moulding Oil P5	0.887	210	-19	26	—	—
Shell Moulding Oil R20	0.890	40	—	—	—	—

INDUSTRIAL PRODUCTS (continued)						
PRODUCT NAME	DENSITY AT 150C kg/L	FLASH POINT OPEN OC	POUR POINT OC	VISCOSITY AT 400C CST	VISCOSITY AT 1000C CST	VISCOSITY INDEX
Shell Turbo Oils T 32	0.871	210	<-12	32	5.2	—
Shell Turbo Oils T 46	0.874	220	<-12	46	6.6	—
Shell Turbo Oils T 68	0.876	240	-9	68	8.5	—
Shell Turbo Oils T 100	0.879	250	-9	100	11.4	—
Shell Turbo Oil GT 32	0.832	240	-15	32	6.2	146
Shell Turbo Oil CC 32	0.890	222	-12	32	5.3	105
Shell Turbo Oil CC 46	0.890	222	-12	46	6.9	105
Shell Turbo Oil J	0.890	222	-18	32	5.3	104
Shell Malleus GL 25	0.993	180	—	—	—	—
Shell Malleus GL 300	1.090	—	—	—	—	—
Shell Malleus GL 400	1.09	180	—	—	—	—
Shell Malleus GL 500	1.10	180	—	—	—	—
Shell Malleus OGM (Heavy)	1.00	>150	—	—	—	—
Shell Dragline Rope Oil XPL	0.891	>61.5	—	225	—	—
Mine Gear 320	0.899	230	—	340	27.4	108
Mine Gear 1500	0.944	230	-6	1533	76	110
Shell Dragline Rope Oil Heavy	0.944	230	-6	1533	76	110
Shell Valvata Oil J 460	0.903	270	-6	460	31.5	99
Shell Valvata Oil J 680	0.93	275	-6	680	37	80
Shell Valvata Oil 1000	0.929	310	-6	1000	40.6	70
Shell Torcula 32	0.873	208	-30	32	5.4	102
Shell Torcula 100	0.895	232	-30	100	11.8	107
Shell Torcula 320	0.903	258	-15	320	25	100
Shell Rustkote Fluid 945	0.806	60	—	3	—	—
Shell Ensis Fluid V	0.870	40	—	—	—	—
Shell VSI 8235 Concentrate	0.886	114	-15	21	—	—
Shell Dromus BL	0.889	>180	—	37	—	—
Shell Adrana D208	1.02	—	—	—	—	—
Shell Lubricool Yellow HW	1.01	>100	<0	—	—	—
Shell Lubricool Green	1.08	—	<0	—	—	—
Shell Lubricool System Cleaner	0.89	>65	<0	18	—	—
Shell Macron GP 32	0.870	200	-15	30.7	—	—
Shell Macron C22	0.872	168	—	22	—	—
Shell Catenex S 523	0.868	210	-15	23	4.5	—
Shell Calibration Fluid S.9365	0.827	—	-27	2.6	—	—



OUTDOOR POWER EQUIPMENT LUBRICANTS						
PRODUCT NAME	DENSITY AT 15OC kg/L	FLASH POINT OPEN OC	POUR POINT OC	VISCOSITY AT 40OC CST	VISCOSITY AT 100OC CST	VISCOSITY INDEX
Shell Chainsaw Bar Oil	0.882	218	-20	108	12.2	103
Shell Lawn 2 Mower Oil	0.885	>63	-21	68	9.3	—
Shell Lawn 4 Mower Oil	0.890	205	-6	120	12.5	97
FOOD GRADE PRODUCTS						
PRODUCT NAME	DENSITY AT 15OC kg/L	FLASH POINT OPEN OC	POUR POINT OC	VISCOSITY AT 40OC CST	VISCOSITY AT 100OC CST	VISCOSITY INDEX
Shell Cassida Chain Oil 150	0.846	260	-54	150	19.0	140
Shell Cassida Chain Oil 1000	0.852	268	-36	1000	80.6	160
Shell Cassida CR 46	0.838	252	-57	46	8.0	148
Shell Cassida GL 220	0.847	270	-48	220	25.0	143
Shell Cassida GL 460	0.855	270	-45	460	46	148
Shell Cassida HF 15	0.819	200	<-60	15	3.6	125
Shell Cassida HF 32	0.832	222	<-60	32	6.1	140
Shell Cassida HF 46	0.836	248	<-60	46	7.9	142
Shell Cassida HF 100	0.841	268	-57	100	14.1	143
Shell Cassida PL	0.772	43	<-63	—	—	—
Shell Cassida Silicone Fluid	0.976	>300	-48	—	—	—
Shell Cassida GLE 150	0.849	250	-54	150	19	142
Shell Cassida GLE 220	0.852	273	-48	220	25	144
Shell FM TLS 150	0.873	263	-12	150	15.1	104
Shell Cassida Grease RLS 2	0.900	>200	—	150	18	—
Shell Cassida Grease EPS 00	0.900	>200	—	220	25	—
Shell Cassida Grease EPS 1	0.900	>200	—	220	25	—
Shell Cassida Grease EPS 2	0.900	>200	—	220	25	—
Shell Cassida Grease HDS 2	0.900	>200	—	800	67	—
Shell Cassida Grease HTS 2	0.900	>150	—	400	40	—
Shell Cassida LTS 1	0.976	>300	-48	20	4.5	—
Shell Ondina Oil 15	0.850	180	-12	15	3.3	—
Shell Ondina Oil 32	0.865	210	-12	32	5.1	—
Shell Ondina Oil 68	0.865	240	-9	68	8.8	—
Shell Snow White Petroleum Jelly	0.82	210	51	—	6	—

MARINE OILS						
PRODUCT NAME	DENSITY AT 15OC kg/L	FLASH POINT OPEN OC	POUR POINT OC	VISCOSITY AT 40OC CST	VISCOSITY AT 100OC CST	VISCOSITY INDEX
Shell Alexia 50	0.932	>205	<-6	225	19.5	70
Shell Melina 30	0.897	227	-18	104	11.8	8
Shell Melina S 30	0.888	227	-18	104	11.6	5
Shell Argina X 40	0.916	205	-18	135	14	40
Shell Argina XL 40	0.921	229	-18	135	14	50
Shell Gadinia AL 30	0.893	>200	-18	94.5	11.4	15
Shell Gadinia AL 40	0.900	>200	-18	140	14.3	15
Shell Gadinia 30	0.897	200	-18	104	11.8	12
Shell Gadinia 40	0.900	225	-18	139	14.4	12
Shell Sirius 15W-40	0.890	205	-27	105	14.3	10
Shell Sirius X 40	0.890	230	-18	139	14	17
Shell Tivela Oil S 220	1.074	298	-39	220	34.4	—
Shell Strombus HS	0.915	>170	5	373	—	—
Shell Strombus MP	0.900	200	-5	273	—	—
LEAISURE MARINE LUBRICANTS						
PRODUCT NAME	DENSITY AT 15OC kg/L	FLASH POINT OPEN OC	POUR POINT OC	VISCOSITY AT 40OC CST	VISCOSITY AT 100OC CST	VISCOSITY INDEX
Shell Nautilus Premium Outboard Oil TCW 3	0.875	96	-36	—	7.3	—
Shell Nautilus Racing Outboard	0.870	92	-36	—	7.2	—
Shell Nautilus Premium 4-Stroke Oil	0.88	210	-33	—	14.5	140
Shell Nautilus Premium Marine Gear 80W-90	0.890	175	-27	150	15.2	—
Shell Nautilus Marine Grease	0.900	>180	—	—	—	—

A

**Abrasion**  
In gears, a type of wear caused when hard particles are trapped between gear teeth.

**Absolute Viscosity**  
See Dynamic Viscosity.

**Additive**  
A substance added to a lubricant to improve its properties or impart new characteristics.

**Air Release**  
The ability of a fluid to allow the escape of air entrained within it.

**Anti-foaming agent**  
An additive included in some lubricant formulations to suppress foam formation.

**Anti-oxidant**  
An additive included in some lubricant formations to inhibit the chemical breakdown of the base oil and some additive constituents by reaction with oxygen.

**Anti-scutting Additive**  
An additive included in some lubricant formulations that is absorbed on to metal surfaces to prevent direct metal-to-metal contact.

**Anti-wear Additive**  
An additive included in some lubricant formulations to reduce friction and wear.

**Apparent Viscosity (of a grease)**  
The observed viscosity of a grease which varies with both temperature and flow rate.

**Aromatic**  
An organic chemical compound built mainly of carbon and hydrogen atoms and containing one or more rings of carbon atoms in which there are some double bonds between adjacent carbon atoms.

**Asphaltene**  
Large and complex chemical compounds in which sulphur, nitrogen, vanadium and nickel are built into aromatic structures. They occur predominantly in heavy residues such as a residual fuel and bitumen.

B

**Biodegradability**  
The capacity of a substance to be broken down by the biological action of living organisms.

**Bleeding**  
Separation of oil from grease. Some bleeding is desirable, since it provides continuous oil lubrication to bearings.

**Bore Polishing**  
A condition which may occur in the cylinders of turbo-charged engines when the cylinder walls appear highly polished. Bore polishing often leads to an increase in oil consumption and wear and to a decrease in engine efficiency.

**Boundary Lubrication**  
A lubrication regime in which the film of lubricant is so thin that surface-to-surface contact takes place over a large area and the load is carried by a very thin film of lubricant.

C

**Calcium Base Grease**  
A grease made from a lubrication fluid thickened with calcium soap. Calcium base grease is highly resistant to water but unstable at high temperatures.

**Cavitation**  
The formation of pockets of air or vapour in a fluid when the pressure on the fluid is reduced.

**Centipoise (cP.)**  
A unit of dynamic viscosity.

**Centistoke (cSt.)**  
A unit of kinematic viscosity.

**Chemical Stability**  
The ability of a substance to resist chemical breakdown.

**Coefficient of friction**  
The ratio of the friction between two surfaces to the load applied.

**Compatibility**  
The ability of substances to exist together without damaging each other.

**Consistency**  
A basic property describing the softness or hardness of a grease, i.e. the degree to which a grease resists deformation under the application of force. Consistency is usually indicated by either apparent viscosity, ASTM penetration, or NLGI Number.

**Corrosion Inhibitor**  
An additive included in some lubricant formulations to help the lubricant protect against corrosion.

**Crosshead**  
A shaft that connects the piston to the connecting rod in double-acting reciprocating compressors and in certain types of piston engine.

D

**Demulsification**  
The separation of an emulsion into its component liquids.

**Detergent**  
An additive included in most engine oil formulations to inhibit deposit formation and protect the lubricated surfaces.

**Dispensability**  
The property of a grease that governs the ease with which it may be transferred from its container to its point of application.

**Dispersant**  
An additive included in some lubricated formulations to hold insoluble contaminants in suspension.

**Distillation**  
The conversion of a liquid to a gas by heating and the subsequent condensation of the gas back to a liquid by cooling, often used for separation and purification.

**Dropping Point**  
Lowest temperature at which a grease is sufficiently fluid to drip, as determined by test method ASTM D 566 or ASTM D 2265. This spec helps determine whether a grease will flow from a bearing at operating temperatures.

**Dynamic Viscosity**  
The viscosity of a fluid defined as the shear stress (the force causing movement between adjacent layers of fluid) divided by the rate of shear (the difference in speed between adjacent layers of fluid).

E

**Emulsification**  
The forming of an emulsion.

**Emulsion**  
A mixture of liquids that do not dissolve in one another consisting of droplets of one liquid dispersed throughout the other.

**Extreme Pressure (EP) Additive**  
An additive included in some lubricant formulations to provide extra protection against wear. Under heavy loads, EP additives form a protective chemical film on the surfaces in contact.

F

**Film Strength**  
The ability of a film of oil or grease to resist rupture due to load, speed, temperature and shock loading.

**Filterability**  
The ability of a liquid to pass freely through a filter without clogging it.

**Flammability**  
Capable of being ignited and burning.

**Flash Point**  
The lowest temperature of a liquid at which the vapour above the liquid can be ignited by an open flame.

**Follower Plate**  
A metal sheet used on top of the grease in a pump-type dispenser to assure the grease remains level as it is pumped. This avoids the formation of a cavity around the pump pick-up tube and enables all the grease to be dispensed without manual leveling from time to time.

**Friction**  
The force which resists relative movement between two surfaces in contact.

**Fuel Injection**  
The introduction of fuel under pressure directly into the cylinders of an internal combustion engine.

G

**Gas Turbine**  
A rotary engine with a driving shaft that is fitted with vanes that are rotated by the pressure of gas passing over them.

**Grease**  
A lubricant with a semi-solid consistency produced by dispersing a thickening agent in a base oil.

**Grease Cup**  
A device for supplying grease to a component from a reservoir attached to the component requiring lubrication.

H

**Helical Gear**  
A pair of gear wheels used to transmit motion between parallel shafts. The teeth of a helical gear wheel are cut on an angle to its axis.

**Herringbone Gear**  
The same as a double helical gear.

**High Speed Diesel Engine**  
A diesel engine, like that used to power road transport vehicles, which operates at speeds of 1,250 rpm or more.

**HVI**  
High Viscosity Index, that is, having a viscosity index of between about 85 and about 115.

**Hydrodynamic Lubrication**  
The lubrication regime which provides the best lubricating conditions and exists when two moving surfaces are completely separated by a relatively thick film of lubricant.

**Hypoid Gear**  
A system of gears for transmitting motion at an angle in which the axis of the pinion does not intersect the axis of the main gear wheel.

I

**Incompatibility**  
Incompatibility occurs when a mixture of two lubricants results in physical properties or performance markedly inferior to those of the individual products. Performance or properties inferior to one of the products but superior to the other may be due to simple mixing and is not considered evidence of incompatibility.

**ISO-Viscosity Grade (VG) System**  
A measure of the viscosity of a lubricant at 40OC as specified in the viscosity grading system laid down by International Standards Organisation.

K

**Kinematic Viscosity**  
A definition of viscosity commonly used by lubricant manufacturers. It is equal to the dynamic viscosity of a liquid divided by its density.

L

**Lacquer**  
A hard, shiny, transparent surface coating usually found in engines and derived from breakdown products of the fuel and lubricant.

**Lithium Base Grease**  
A product prepared from a lubricating fluid thickened with lithium soap. Lithium base grease resists both heat and moisture.

**Low Speed Diesel Engine**  
A diesel engine, like that used to power marine transport, which operates at speeds of less than 350 rpm.

**LVI**  
Low Viscosity Index, that is, having a viscosity index of less than about 30.

M

**Mechanical Stability**  
The ability of a grease to resist a breakdown in its structure when mechanically worked.

**Medium Speed Diesel Engine**  
A diesel engine, like that used for electricity generation, which operates at speeds between 350 and 1,250 rpm.

**Metal Deactivator**  
An additive which inhibits the corrosivity of other formulation components towards sensitive metals, such as copper, by a passivating action.

**Miscibility**  
To be confirmed – The tendency or capacity of two or more liquids to form a uniform blend, that is, to dissolve in each other. Degrees are total miscibility, partial miscibility, and immiscibility.

**Mixed Base Grease (mixed soap grease)**  
A grease made by co-crystallisation of two or more metallic soaps usually lithium and calcium.

**Mixed Lubrication**  
The lubrication regime which exists when moving surfaces are separated by a continuous film of lubricant with a thickness comparable to the roughness of the surfaces.

**Monograde**  
An oil with a viscosity which satisfies the requirements of only one grade of the SAE grading system.

**Multi-stage Compressor**  
A machine which essentially consists of several linked compressors, one feeding compressed gas to the next for further compression.

**Multigrade**  
An oil with a viscosity which satisfies the requirements of more than one grade of the SAE grading system.

**MVI**  
Medium viscosity index, that is, having a viscosity index of between about 30 and about 85.

N

**Non-soap Thickener**  
A substance such as clay, silica gel, carbon black, or any of several specially treated or synthetic materials that can be either thermally or mechanically dispersed in liquid lubricants to form lubricating grease. Also called synthetic thickener. Certain types are called inorganic thickeners.

O

**Oil Mist Lubrication**  
A system of lubrication used in some gearboxes in which the lubricant is atomised and sprayed into the gearbox in a stream of dry compressed air.

**Oil Separation**  
In greases, the separation of the base oil from the thickener.

**Oil-immersed Brakes**  
An automotive braking system which is installed in the vehicle gearbox or rear axle, rather than at the wheels.

**Oxidation Stability**  
The ability of a chemical to resist chemical breakdown by the action of oxygen.

P

**Paraffin**  
An alternative term for alkane, no longer considered correct terminology.

**Penetration**  
An arbitrary measure of consistency (hardness), based on ASTM Method D217 and reported as the depth, in tenths of millimeters, that a standard cone penetrates the sample in a standard cup under prescribed conditions of weight, time and temperature. All penetration measurements are in an inverse scale of consistency – that is, the softer the consistency, the higher the penetration of a sample immediately after it has been brought to 25OC and subjected to 60 double strokes in a standard grease worker. UNWORKED PENETRATION is the penetration at 25OC of a sample of what has received only the minimum handling in transfer from its original container to the test apparatus and which has not been subjected to the action of a grease worker.

**Pinion**  
The smaller gear wheel of a pair.

**Piston Pump**  
A type of pump used in hydraulic systems which pumps fluid by means of reciprocating pistons moving in cylinders.

**Piston Rings**  
A springy metal ring which seals the gap between a piston and its cylinder wall.

**Pitting**  
In gears, a type of wear in which cracks develop in gear teeth because of metal fatigue caused by overloading.

**Plain Bearing**  
The simplest kind of bearing which consists of two flat surfaces moving relative to one another.

**Polymer**  
A chemical compound of large molecular size which is built up from numerous smaller molecules linked together

**Pour Point**  
The lowest temperature at which an oil will just flow.

**Pour Point Depressant**  
An additive included in some lubricant formulations to minimize the tendency of an oil to congeal when it is cooled.

R

**Rack and Pinion**  
A gear system used for converting rotary motion into linear motion or vice versa. It consists of a toothed bar (the rack) which meshes with a toothed wheel (the pinion).

**Reciprocating Compressor**  
A machine which compresses gases by the action of a piston moving in a cylinder.

**Rocker Arm**  
A lever which is operated automatically to open and close the valves of an internal combustion engine.

**Rolling Bearing**  
A general term describing all types of ball and roller bearings.

**Rotary Compressor**  
A machine in which gas compression is achieved by the revolution of a rotor or rotors.

**Rotary Screw Compressor**  
A machine which compresses air by the action of two intermeshing screws or rotors.

**Rotary Vane Compressor**  
A machine which compresses air through the action of sliding vanes set in slots in a rotor which turns in a cylindrical casing.

**Rust Inhibitor**  
An additive included in some lubricant formulations to restrict the formation of rust on lubricated surfaces.

S

**SAE System**  
A system devised by the Society of Automotive Engineers for classifying engine and automotive gear lubricants according primarily to their viscosity

**Saponification**  
The chemical conversion of a fatty acid and base or alkali into a soap. A common process in grease manufacture.

**Scavenging**  
The removal of waste gases from the cylinder of a two-stroke internal combustion engine.

**Scoring**  
The same as scuffing.

**Screw Pump**  
A pump used in some hydraulic systems which pumps fluid through the action of intermeshing screws.

**Scuffing**  
In gears, a type of wear which develops when direct metal-to-metal contact takes place between gear teeth.

**Self-aligning Bearing**  
A rolling bearing in which the applied load is distributed uniformly within the bearing even when the alignment of the shaft changes.

**Separator**  
In rolling bearings, the same as a cage. In compressed air systems, the same as a coalescer.

**Shear Stability**  
The ability of a liquid to resist being degraded by mechanical shearing forces. Also refers to the ability of a grease to resist changes in consistency.

**Silicone**  
A complex synthetic polymer composed of repeated silicon containing units and often used where a chemically inert lubricant is required.

**Single-acting Compressor**  
A reciprocating compressor with cylinders that contain only one compression chamber.

**Single-stage Compressor**  
A machine which takes in a gas and compresses it fully in one action.

**Sliding Bearing**  
A bearing which supports a load and allows it to slide.

**Sliding Vane Compressor**  
The same as a rotary vane compressor.

**Sludge**  
A black sooty deposit which usually forms in engines as a result of oil oxidation and ineffective dispersancy.

**Slumpability**  
A property of some greases that makes them partially self-levelling. Greases possessing this property can be pumped from a container without the need for a follower plate.

**Spectrographic Oil Analysis (SOA)**  
A sophisticated analytical technique for determining the types and quantities of elements in an oil sample.

**Soap**  
A compound formed in the reaction between a metal hydroxide (such as lime) and a fatty acid (an organic acid derived from natural fats), e.g. lithium, calcium soaps in grease.

**Sodium base grease (Soda grease)**  
A grease prepared from a lubricating fluid thickened with Sodium Soap, stable at high temperatures but washing out in moist conditions.

**Solid Lubricant**  
Any class of lubricants in which the reduction of friction and wear during sliding is caused by making the shearing take place within the crystal structure of a material with low shear strength in one particular plane. Examples include graphite, molybdenum disulphide, and certain soaps. Lubricating grease is not a solid lubricant, but may contain solid lubricants as additives.

**Spark Ignition**  
The system of ignition used in a petrol engine in which a fuel/air mixture is ignited by an electric spark.

**Splash Lubrication**  
A system of lubrication in which a machine part travels through an oil bath and, in doing so, splashes lubricant on to nearby surfaces requiring lubrication.

**Spray Lubrication**  
A system of lubrication in which the lubricant is sprayed directly on to the surfaces to be lubricated.

**Spur Gear**  
A pair of toothed wheels used to transmit power between parallel shafts. The teeth of a spur gear wheel are cut parallel to its axis.

**Squawk**  
A harsh abrupt sound sometimes emitted by oil-immersed braking systems.

**Stabiliser**  
An additive which may be included in some grease formulations to ensure that the base oil and thickener form a stable mixture with a uniform composition.

**Static Friction**  
The force which tends to prevent one body sliding over another.

**Stick-slip**  
A jerky type of motion in which a moving part of a machine tends to stick as static friction builds up to a maximum and then slips as the static friction is overcome.

**Sump**  
The lower section of the crankshaft housing used as a lubricating reservoir in an internal combustion engine.

**Super-charger**  
A device which is able to supply air to an internal combustion engine at a higher-than-normal pressure.

**Synthetic**  
Produced artificially rather than occurring naturally.

T

**Tackiness Additive**  
An additive which may be included in the formulation of lubricants for slideways and open gears to help the lubricant adhere more effectively.

**TAN**  
Total acid number. A measure of the acidity of a lubricant, usually expressed in terms of the amount of alkali needed to neutralize it. A measurement of TAN can give an indication of the deterioration of an oil in service due to oxidation.

**Tapered Roller Bearing**  
A rolling bearing which is suitable for carrying both radial and thrust loads because its rolling elements are cone-shaped.

**TBN**  
Total base number. A measure of the reverse of basicity of a lubricant. A measurement of TBN can often give important information about the depletion of basic additives.

**Thermal Conductivity**  
The ability of a material to conduct heat.

**Thermal Stability**  
The ability of a substance to resist degradation due to the effects of heat.

**Thick Film Lubrication**  
The same as hydrodynamic lubrication.

**Thickening Agent**  
A substance used in making greases which is mixed with base oil to produce a stable semi-solid product.

**Toxicity**  
The capacity of a substance to harm living organisms.

**Transmission**  
The assembly of parts, including the clutch, gearbox and propeller shaft, by which power is transmitted from an engine of a motor vehicle to the wheels.

**Trunk Piston Engine**  
An internal combustion engine in which the piston is connected directly to the connecting rod and thence to the crankshaft.

**Turbo-charger**  
A compressor device driven by an exhaust gas turbine that is used to supply air at a higher-than normal pressure to the cylinders of an internal combustion engine.

U

**Universal Farm Oil**  
A lubricant for agricultural tractors and farm machinery which is able simultaneously to carry out the functions of an engine oil, transmission oil and hydraulic oil.

V

**Vane Pump**  
A device which pumps fluid through the action of sliding vanes set in slots in a rotor which turns in a cylindrical casing.

**Varnish**  
A hard, shiny, transparent surface coating sometimes found in engines and derived from breakdown products of the fuel and lubricant.

**Viscosity**  
Resistance to flow.

**Viscosity Index: (VI)**  
An arbitrary number which indicates how the viscosity of a fluid varies with changes in temperature. A fluid with a viscosity which is relatively sensitive to changes in temperature has a low viscosity index.

**Viscosity Index Improver**  
An additive which may be added to some lubricating oils to make their viscosity less sensitive to changes in temperature.

**Volatility**  
The tendency of an oil to evaporate on heating.

W

**Water Resistance**  
The ability of a lubricant to withstand the addition of water to the lubricant system without adverse effects.

**Water Separability**  
The ability of a lubricating oil to shed any water with which it has become intimately mixed.

**Worm Gear**  
A gear consisting of a toothed wheel and a short revolving screw working together.

X

**XHVI®**  
A Registered Trade Mark used to describe Shell manufactured synthetic base oils with an exceptionally high viscosity index.

Y

**Yield Point**  
The point at which a grease just begins to flow when pressure is applied to it.



SAE VISCOSITY CLASSIFICATIONS (Society of Automotive Engineers)

SAE VISCOSITY GRADES FOR ENGINE OILS <sup>1</sup> (SAE J300 December 1999)					
SAE VISCOSITY GRADE	VISCOSITY (cP) AT TEMP (°C), MAX.		VISCOSITY <sup>4</sup> (cSt) AT 100°C		HIGH-SHEAR VISCOSITY <sup>5</sup> (cP) AT 150°C AND 10 SEC <sup>-1</sup> , MIN.
	CRANKING <sup>2</sup>	PUMPING <sup>3</sup>			
			MIN.	MAX.	
0W	6200 at -35	60,000 at -40	3.8	–	–
5W	6600 at -30	60,000 at -35	3.8	–	–
10W	7000 at -25	60,000 at -30	4.1	–	–
15W	7000 at -20	60,000 at -25	5.6	–	–
20W	9500 at -15	60,000 at -20	5.6	–	–
25W	13000 at -10	60,000 at -15	9.3	–	–
20W	–	–	5.6	<9.3	2.6
30W	–	–	9.3	<12.5	2.9
40W	–	–	12.5	<16.3	2.9 <sup>6</sup>
40W	–	–	12.5	<16.3	3.7 <sup>7</sup>
50W	–	–	16.3	<21.9	3.7
60W	–	–	21.9	<26.1	3.7

<sup>1</sup>All values are critical specifications as defined by ASTM D3244.

<sup>2</sup>ASTM D5293.

<sup>3</sup>ASTM D4684. Note that the presence of any yield stress detectable by this method constitutes a failure regardless of viscosity.

<sup>4</sup>ASTM D445.

<sup>5</sup>ASTM D4683, CEC L-36-A-90 (ASTM D4741) or ASTM DS481.

<sup>6</sup>OW-40, 5W-40 & 10W-40 grades.

<sup>7</sup>15W-40, 20W-40, 25W-40 & 40 grades.

1 cP = 1 mPa·s. 1 cSt = 1 mm²/s.

SAE J306 MAR85: Axle and Manual Transmission Oil Viscosity Classification

SAE VISCOSITY GRADE	MAXIMUM TEMPERATURE FOR VISCOSITY OF 150 000 cP °C	VISCOSITY AT 100°C MINIMUM cSt	MAXIMUM Cst
70W	-55	4.1	–
75W	-40	4.1	–
80W	-26	7.0	–
85W	-12	11.0	–
90 ✓	–	13.5	<24.0
140 ✓	–	24.0	<41.0
250 ✓	–	41.0	

Note: 1 cP = 1 mPa.s; 1 cSt = 1mm²/s

MIL-L-2105E: Axle and Manual Transmission Oil Viscosity Classification

SAE VISCOSITY GRADE	VISCOSITY AT 100°C MIN. cSt	MAX. cSt	MAXIMUM TEMPERATURE FOR VISCOSITY OF 150 000 cP C	CHANNEL POINT (C) MAX.	FLASH POINT (C) MIN
75W	4.1		-40	-45	150
80W-90	13.5	24.0	-26	-35	165
85W-140	24.0	41.0	-12	-20	180

NLGI Grease Classification (National Lubricating Grease Institute)

GRADE NO.	ASTM WORKED PENETRATION AT (25°C)
000	445/475
00	400/430
0	355/385
1	310/340
2	265/295
3	220/250
4	175/205
5	130/160
6	85/115

ISO Viscosity Numbers

ISO Viscosity Classification

The ISO viscosity classification uses centistoke (cSt) units and relates to the viscosity at 40°C. It consists of a series of 18 viscosity brackets between 1.98 cSt and 1650.0 cSt each of which is defined by a number. The numbers indicate, to the nearest whole number, the mid-points of their corresponding viscosity brackets.

ISO VISCOSITY GRADE	MID-POINT VISCOSITY cSt at 40.0°C	KINEMATIC VISCOSITY LIMITS cSt at 40.0°C	
		MIN.	MAX.
ISO 2	2.2	1.98	2.42
ISO 3	3.2	2.88	3.52
ISO 5	4.6	4.14	5.06
ISO 7	6.8	6.12	7.48
ISO 10	10	9.00	11.00
ISO 15	15	13.50	16.50
ISO 22	22	19.80	24.20
ISO 32	32	28.80	35.20
ISO 46	46	41.40	50.60
ISO 68	68	61.20	74.80
ISO 100	100	90.00	110.00
ISO 150	150	135.00	165.00
ISO 220	220	198.00	242.00
ISO 320	320	288.00	352.00
ISO 460	460	414.00	506.00
ISO 680	680	612.00	748.00
ISO 1000	1000	900.00	1100.00
ISO 1500	1500	1350.00	1650.00



Viscosity Conversion Tables

Viscosities of lubricating oils have generally been quoted in one or other of the following terms depending on the instrument used for the viscosity determination.

Kinematic	Viscosity in centiStokes	(VK. cSt)
Redwood 1	Viscosity in seconds	(RI")
Saybolt Universal	Viscosity in seconds	(SUS")
Engler	Viscosity in degrees	(°E)

A move to the use of centiStokes is well established but, for many years, it will be necessary to convert back and forth between the various units. The international standard unit for viscosity is mm²/sec being numerically identical to centiStokes.

For most application purposes in industry where appreciable tolerances in viscosity limits are normal, the following table will serve for direct conversion of viscosities expressed in one form of measurement to viscosities in another form, provided always such conversions or comparisons have reference to identical temperature conditions.

SAYBOLT				SAYBOLT				SAYBOLT			
KINEMATIC	REDWOOD 1	UNIVERSAL	ENGLER	KINEMATIC	REDWOOD 1	UNIVERSAL	ENGLER	KINEMATIC	REDWOOD 1	UNIVERSAL	ENGLER
CENTISTOKES	SECONDS	SECONDS	DEGREES	CENTISTOKES	SECONDS	SECONDS	DEGREES	CENTISTOKES	SECONDS	SECONDS	DEGREES
2.0	31	32.6	1.12	33	137	155.2	4.46	104	426	484	13.73
2.5	32	34.4	1.17	34	141	159.7	4.58	106	435	493	13.99
3.0	33	36.0	1.22	35	145	164.3	4.71	108	443	502	14.26
3.5	35	37.6	1.26	36	149	168.8	4.84	110	451	511	14.52
4.0	36	39.1	1.31	37	153	173.3	4.96	112	459	521	14.78
4.5	37	40.7	1.35	38	157	178.0	5.10	114	467	530	15.05
5.0	39	42.3	1.39	39	161	182.4	5.22	116	476	540	15.31
5.5	40	44.0	1.44	40	165	187.0	5.35	118	484	549	15.58
6.0	41	45.6	1.48	41	169	191.5	5.48	120	492	558	15.84
6.5	43	47.2	1.52	42	173	196.0	5.61	122	500	567	16.10
7.0	44	48.8	1.56	43	177	200.5	5.74	124	508	577	16.37
7.5	45	50.4	1.61	44	181	205.0	5.87	126	517	586	16.63
8.0	46	52.1	1.65	45	185	209.8	6.00	128	525	595	16.90
8.5	48	53.8	1.71	46	189	214.5	6.13	130	533	605	17.16
9.0	49	55.5	1.75	47	193	219.0	6.26	132	541	614	17.42
9.5	51	57.2	1.80	48	197	223.7	6.38	134	549	623	17.69
10.0	52	58.9	1.84	49	201	228.3	6.51	136	558	632	17.95
10.5	54	60.7	1.89	50	205	233.0	6.64	138	566	642	18.22
11.0	55	62.4	1.94	51	209	237.5	6.77	140	574	651	18.48
11.5	57	64.2	1.98	52	213	242.2	6.90	142	582	658	18.74
12.0	58	66.0	2.03	53	218	246.8	7.04	144	590	667	19.01
12.5	60	67.9	2.08	54	222	251.5	7.17	146	599	677	19.27
13.0	62	69.8	2.13	55	226	256.0	7.30	148	607	686	19.54
13.5	64	71.7	2.18	56	230	260.7	7.43	150	615	695	19.80
14.0	65	73.6	2.23	57	234	265.3	7.56	152	623	705	20.06
14.5	67	75.5	2.28	58	238	270.0	7.69	154	631	714	20.33
15.0	68	77.4	2.33	59	242	274.7	7.82	156	640	723	20.59
15.5	70	79.3	2.39	60	246	279.2	7.95	158	648	732	20.86
16.0	72	81.3	2.44	61	250	284.0	8.04	160	656	742	21.12
16.5	74	83.3	2.50	62	254	288.5	8.18	164	672	760	21.65
17.0	75	85.3	2.55	63	258	295.6	8.31	168	689	779	22.18
17.5	77	87.4	2.60	64	262	297.7	8.45	172	705	797	22.70
18.0	79	89.4	2.65	65	266	302.4	8.58	176	722	816	23.23
18.5	81	91.5	2.71	66	271	307.0	8.72	180	738	834	23.76
19.0	82	93.6	2.77	67	275	311.7	8.85	184	754	853	24.29
19.5	84	95.7	2.83	68	279	316.3	8.98	188	771	871	24.82
20.0	86	97.8	2.88	69	283	321.0	9.11	192	787	890	25.34
20.5	88	99.9	2.94	70	287	325.5	9.24	196	804	908	25.87
21.0	90	102.0	3.00	72	295	335	9.51	200	820	927	26.40
21.5	92	104.2	3.06	74	303	344	9.77	204	836	946	26.93
22.0	94	106.4	3.11	76	311	353	10.03	208	853	964	27.46
22.5	96	108.5	3.17	78	319	363	10.30	212	869	983	27.98
23.0	97	110.7	3.23	80	328	372	10.56	216	886	1,001	28.51
23.5	99	112.8	3.29	82	336	381	10.82	220	902	1,020	29.04
24.0	101	117.1	3.41	84	344	391	11.09	224	918	1,038	29.57
24.5	103	117.1	3.41	86	352	400	11.35	228	935	1,057	30.10
25.0	105	119.3	3.47	88	360	410	11.62	232	951	1,075	30.62
26	109	124.0	3.59	90	369	419	11.88	236	968	1,094	31.15
27	113	128.5	3.71	92	377	428	12.14	For higher viscosities use the following factors: RI = 4.10 VK. SU = 4.635 VK. E = .132 VK.			
28	117	133.0	3.83	94	385	438	12.41				
29	121	137.5	3.96	96	393	447	12.67				
30	125	141.7	4.08	98	401	456	12.94				
31	129	146.0	4.21	100	410	465	13.20				
32	133	150.7	4.33	102	418	475	13.46				

Storage and Handling of Lubricants

**Storing Lubricants**  
Packages containing lubricants should, whenever possible, be stored under cover where they will not be exposed to the action of the weather.

Small packages such as tins should always be kept in covered storage, as should any package, whatever its size, once it has been opened and its contents partially used. When the outside storage of unopened drums is unavoidable, certain simple precautions must be observed.

The drums should preferably be stored on their sides with bungs at 3 o'clock and 9 o'clock and wooden dunnage or runners should be used to keep them clear of the ground and to prevent rusting of the undersides. They should never be stacked directly on a surface containing clinker, which is particularly corrosive to metal. The drums at each end of a stack must be securely wedged to prevent movement. Regular inspection should be carried out with a view to the detection of leaks and to make sure that identification markings remain clear and legible.

If, for any reason, drums have to be stored on their ends, they should be raised off the ground and stored upside down (i.e. with the bungs at the bottom). Failing this, they should be tilted so that rain water cannot collect round and submerge the bungs. Water contamination is undesirable, whatever the grade of lubricant, and it is not always realised that moisture can enter a drum through what appears to be a perfectly sound bung.

A drum standing in the open is subjected to the heat of the day and, of course, cools down again at night. This results in expansion and contraction of the contents with the effect that the air in the space above the oil level is subjected, during the day, to slightly higher than atmospheric pressure and, at night, to slight vacuum. These changes in pressure may be sufficiently great to cause a pumping action, known as breathing, in which air is forced out the drum during the day and drawn into it at night. If, therefore, the bungs through which this breathing takes place are surrounded by water, some of this water may be sucked into the drum and, in the course of time, quite considerable quantities may accumulate.

Once the seals have been broken and packages have been opened, there is always a danger that, unless the packages are kept properly closed when not in use, impurities such as dust, sand and fibre may enter them. Such contaminants, eventually finding their way into machinery, can cause damage or abrasion or, by blocking oilways, can result in a complete breakdown due to lack of lubrication.

An oil drum, or other package, should never be opened by cutting a large hole in it or by completely removing one end, since, even if the hole is kept covered by, for example, a wooden or metal lid, the chances of contamination are greatly increased. Similarly, it is a bad practice to dip an open container into the oil since, not only does this allow dust to enter, but the outside of the dipper itself may be dirty. Drums of oil should, therefore, be placed on their sides on wooden cradles of convenient height and the oil dispensed by means of a tap under which a drip tray is placed. Alternatively, a drum may be stood on its end and the oil withdrawn by means of a hand pump, the pump intake being inserted into the large bung-hole.

When oil is stored in bulk it is probable that water or condensation will accumulate and fine dust find its way into the tanks with the result that, eventually, a layer of sludge-like material builds up at the bottom of the tanks and leads, in time, to contamination of the oil. Consequently, it is advisable to have storage tanks fitted with dished or sloping bottoms provided with drain cocks, which will enable dregs to be drawn off periodically. Where practicable, bulk storage tanks should periodically be cleaned out.

Insofar as greases are concerned, the drums must, of necessity, have a large opening and, to avoid as far as possible the entry of dirt and water, it is important that the lid or cover should always be replaced firmly and securely as soon as requirements have been taken.

Extremes of temperature are not good for lubricants. They should not be stored in any unduly warm place; equally, it is not wise to leave them for long periods in conditions of extreme cold.

Handling Lubricants

The benefits of good, clean storage can be largely nullified if a lubricant becomes contaminated in transit from the store to the machines. The containers used for transporting lubricants on a site and for the storage of small working quantities must be kept clean and should be provided with lids to prevent the entry of dust and dirt. They should be washed periodically with gasoline, care being taken to mop and dry them before using them again.

Similarly, funnels and other pieces of apparatus must always be kept scrupulously clean, rags and wipers being used for this purpose. Cotton waste or woollen rags should not be used as they tend to leave behind fibres which will eventually find their way into machinery and impair the flow of oil.

It is advisable to have separate, clearly marked containers of each grade of oil or grease so the contamination of one with another does not take place.

Used and dirty oil should be put into special containers and stored in separate, clearly labelled receptacles unit disposed of. Every precaution must be taken to see that used lubricants are not allowed to contaminate fresh oils and greases.

In general, cleanliness precautions are even more important with grease than with oil. There is always the chance that impurities in oil may sink to the bottom of the tank or container out of harm's way; with grease this cannot happen and any grit or other contaminant which gets into the grease is bound to find its way into lubricators and machinery sooner or later.

Grease is more susceptible than oil to the effects of temperature and temperature cyclings. High temperature or prolonged exposure to even moderately high temperatures (e.g., tropical sunshine) may cause oil to separate out with the result that the grease loses some of its lubricating properties. Petrolatum (petroleum jelly) and certain types of grease can be made liquid by heating and, on cooling, will regain their former condition; but these are exceptions and most greases will be ruined if treated in this way. Never, therefore, heat a grease to make it fluid.

# GENERAL INFORMATION

The lubrication of machinery should be supervised by a responsible person and should be made a routine procedure. For instance, when a machine requires oil-can applications daily, it should become routine to do this job each morning before commencing to use the machine. Where grease lubrication is called for weekly, this should be done, for instance, first thing Monday morning or last thing before shutting down for the weekend.

Each operator should know which grades of lubricant are recommended for the equipment in his/her charge and supplies of the correct lubricants and the handling equipment should be readily available to him.

As lubricants are dispensed, the quantities should be measured and a record maintained. Store room records should show the quantities issued and the records should be kept for each machine or unit. By this means, regular checks can be made on consumptions and any marked changes noted. These should be investigated at once.

Increased consumption is quite often the first sign that a machine is in need of repair, or that its lubricating system requires adjustments; on the other hand, it may mean over-lubrication by the operator.

### Personal Hygiene

Shell lubricants are quite safe to use provided ordinary care is taken to minimise skin contamination and to avoid breathing oil mist or vapours.

However, prolonged improper use can cause dermatitis or other skin conditions or even, where heavy contamination occurs over many years, skin cancer.

Those at risk are people who use oils every day over periods of months or years, not those who work with oils only very occasionally. The risks can be **avoided** by carrying out the following simple health precautions.

For advice contact a Poisons Information Centre  
(Phone: Australia 13 11 26,  
New Zealand 0800 764 766)  
or a Doctor (at once).

### Special oils and compounds

The types of oil which have been associated overseas with skin disorders appear to be those which have been lightly refined and which contain relatively more polynuclear aromatic compounds. Oils of this type are used in rubber processing. Particular care should be taken in these cases.

When working regularly with mineral oils follow these simple rules:

1. REDUCE skin contamination by mineral oils to the minimum and avoid breathing their mists or vapours.
2. PROTECT the skin by using suitable clothing and barrier creams.
3. CLEAN the skin thoroughly if contaminated with oil.
4. CARE for the skin properly.
5. WEAR clean intact clothes.

### Avoiding contact with mineral oils

Contact with mineral oils should be kept to a minimum by using effective splash guards and correct work methods. Good maintenance should be practised so as to avoid oil-soaked floors or benches.

Where cutting oils are used, these should be changed at regular intervals to minimise contamination with abrasive metal particles or bacteria. To keep circulating oil as free as possible of abrasive particles, filter and sumps should be regularly inspected and cleaned out.

Minimise mist and vapour generation. If this cannot be done, use proper ventilation to keep the breathing zone concentration of oil mist below the recommended maximum concentration in air of 5mg per cubic metre of air.

### Personal protection

To minimise skin contamination by oils, wear protective gloves and aprons and suitable outer overalls. Where soluble oil concentrates are used, wear goggles or face visors.

Protective clothing should be cleaned at regular intervals to remove oil. It is **most important** to avoid wearing oil-soaked clothing, and hands should be cleaned with disposable wipes which should not be kept in overall or trouser pockets after use.

Gloves can become contaminated on the inside and when worn again they bring the skin into close and repeated contact with oil. A system of regular and frequent changing and cleaning of all protective clothing is the best safeguard.

Where contamination with mineral oils occurs regularly at work, for example when using soluble cutting oils with high-speed machinery, it is necessary to give more rigorous attention to adequate laundering and regular changes of clothing and underclothing. To avoid soiling of clean clothing, contaminated clothing should be stored separately from street clothing.

### Cleansing the skin

Oil should not be left on the skin for any prolonged period of time, particularly if mineral oils are used every day at work. Skin contaminated with oil should be cleaned with mild soap or suitable hand cleansers at regular intervals, and particularly at the end of a working day.

Strong soaps and detergents, and abrasive skin cleansers should be avoided as these themselves can cause skin irritation.

Solvents such as petrol, kerosene, trichloroethane and similar fluids **should not be used** for cleaning oil off the skin.

### Barrier and restorative creams

The natural oils in the skin which form a protective barrier are often removed by the regular washing needed in industry. The natural protective barrier can be replaced to a certain extent by using a good barrier cream before work and a good hydrophilic skin cream containing lanoline or vegetable oils after finally washing the hands at the end of the work period.

### Care of the skin

Where any sign of irritation or rash appears on the skin, medical attention should be sought at the earliest opportunity.





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**Tel** 0800 474 355

**Fax** 0800 743 553

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or go to [www.epc.shell.com](http://www.epc.shell.com) for Technical Data Sheets (TDS)